Enclosure 1

2021 Report of the Statewide Advisory Committee on Cooling Water Intake Structures

FINAL

March 26, 2021

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Acronyms and Abbreviations

AFC	Application for Certification
BAA	Balancing Authority Area
BARCT	Best Available Retrofit Control Technology
CAISO	California Independent System Operator
CARB	California Air Resources Board
CCGT	Combined Cycle Gas Turbine
CEC	California Energy Commission
CPUC	California Public Utilities Commission
HE	Hour Ending
IEPR	Integrated Energy Policy Report
IOU	Investor-Owned Utility
IRP	Integrated Resource Planning
LADWP	Los Angeles Department of Water and Power
LCR	Local Capacity Requirement
LTPP	Long-Term Procurement Plan
MGD	Million Gallons per Day
MVAR	Mega Volt, Ampere, Reactive
MW	Megawatt
NPDES	National Pollutant Discharge Elimination System
NQC	Net Qualifying Capacity
OTC	Once-Through Cooling
PDT	Pacific Daylight Time
PPA	Power Purchase Agreement
PRM	Planning Reserve Margin
PTA	Petition to Amend
PTC	Permit to Construct
PTO	Participating Transmission Owner
RECLAIM	Regional Clean Air Initiatives Market

RMR	Reliability Must Run
SACCWIS	Statewide Advisory Committee on Cooling Water Intake Structures
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCGT	Single Cycle Gas Turbine
SDG&E	San Diego Gas & Electric
SLC	State Lands Commission
SONGS	San Onofre Nuclear Generating Station
State Water Board	State Water Resources Control Board
TMDL	Total Maximum Daily Load
TSO	Time Schedule Order

I. Introduction

The Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS) has prepared this report to the State Water Resources Control Board (State Water Board) to summarize the State of California's current electrical grid reliability needs and to recommend a two-year extension to the compliance schedule for Redondo Beach Generating Station (Redondo Beach) to address system-wide grid reliability needs.

The SACCWIS includes representatives from the California Energy Commission (CEC), California Public Utilities Commission (CPUC), California Coastal Commission (CCC), California State Lands Commission (SLC), California Air Resources Board (CARB), the California Independent System Operator Corporation (CAISO), and the State Water Board. The State Water Board, in adopting the Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling, also known as the Once-Through Cooling (OTC) Policy,[1] impaneled the SACCWIS to advise the State Water Board on the implementation of the OTC Policy. The SACCWIS provides recommendations to ensure the compliance schedule takes into account the reliability of California's electricity supply, including local area reliability, statewide grid reliability, and permitting constraints. Section 3.B(4) of the OTC Policy provides that the SACCWIS will report to the State Water Board with recommendations on modifications to the compliance schedule each year.

Since 2010, the OTC Policy has reduced marine and estuarine water use by electric generators in California and lessened entrainment and impingement mortality of marine life. The SACCWIS is committed to realizing full compliance with the OTC Policy in the coming years, while maintaining the reliability of California's electric system and meeting the state's environmental and energy goals.

This report primarily focuses on power generating facilities within the California Independent System Operator (CAISO) balancing authority area (BAA). It does not focus on facilities owned or operated by the Los Angeles Department of Water and Power

[1] The most recent version of the OTC Policy is available on the State Water Board's website.

(LADWP), as those compliance dates were reviewed and modified by the State Water Board in July 2011.

On November 7, 2019, the CPUC adopted Decision (D.) 19-11-016, which directed load serving entities under its jurisdiction to procure 3,300 MW of capacity by August 1, 2023, and also recommended extensions of OTC Policy compliance dates for four OTC generators while procurement is underway. On January 23, 2020, the SACCWIS recommended a slightly modified extension schedule for the same four generators. On September 1, 2020, the State Water Board amended the OTC Policy under Resolution No. 2020-0029, which extended the compliance dates of four power plants to address system-wide grid reliability in the CAISO BAA. This OTC Policy amendment was approved by the Office of Administrative Law on November 30, 2020. The OTC Policy amendment extended the compliance dates as follows:

- Alamitos Generating Station Units 3, 4, and 5 for three years until December 31, 2023;
- Huntington Beach Generating Station Unit 2 for three years until December 31, 2023;
- Ormond Beach Generating Station Units 1 and 2 for three years until December 31, 2023; and
- Redondo Beach Generating Station Units 5, 6, and 8 for one year until December 31, 2021.

In August 2020, swaths of the western United States encountered a prolonged and extreme heat storm. This led to a series of circumstances that ultimately required the CAISO to initiate rotating outages in its BAA to prevent wide-spread service interruptions. Since that time, critical uncertainties have sparked efforts from the CPUC, CAISO, and CEC to revise their forecasting models and have highlighted the need for additional capacity.

On November 19, 2020, the CPUC adopted Rulemaking (R.) 20-11-003, which directs the CPUC to consider short-term procurement to address potential grid reliability issues starting in summer 2021. The CPUC adopted D.21-02-028 on February 11, 2021, which

directed the three investor-owned utilities to undertake expedited procurement for capacity that will be available to serve demand in the summer of 2021. D.21-02-028 also anticipates a subsequent decision in R.20-11-003 to address 2022 capacity needs. While this proceeding and other CPUC procurement efforts are still ongoing, a comprehensive stack analysis conducted by the CPUC, CAISO, and CEC indicates that additional procurement is needed to mitigate grid reliability concerns. The power generated by Redondo Beach will help offset projected system-wide shortfalls during periods of high energy demand.

As a result, the SACCWIS recommends the State Water Board extend the OTC Policy compliance date of Redondo Beach Units 5, 6, and 8 for two years through December 31, 2023.

II. Status of Compliance and Once-Through Cooling Water Use

Since the OTC Policy was adopted in 2010, several power generating units have retired, repowered, or come into compliance. The closure of the San Onofre Nuclear Generating Station (SONGS) resulted in a significant reduction in projected ocean or estuarine water use for power plant cooling. Table 1 shows the power plants in the CAISO and LADWP BAAs that have achieved compliance, several of which did so well in advance of their mandated compliance deadlines.

Table 1: OTC Compliance Achievement

Facility & Units	NQC (MW)[2]	OTC Policy Scheduled Compliance Date	Actual Compliance Date
Humboldt Bay 1, 2	135	Dec. 31, 2010	Retired Sept. 30, 2010
South Bay	296	Dec. 31, 2011	Retired Dec. 31, 2010
Potrero 3	206	Oct. 1, 2011	Retired Feb. 28, 2011

[2] Net Qualifying Capacity (NQC) in Mega Watts (MW). NQC is the net amount of capacity available from a resource that can be counted towards meeting Resource Adequacy Requirements.

Facility & Units	NQC (MW)[2]	OTC Policy Scheduled Compliance Date	Actual Compliance Date
Huntington Beach 3, 4	452	Dec. 31, 2020	Retired Nov. 1, 2012[3]
Contra Costa 6, 7	674	Dec. 31, 2017	Retired Apr. 30, 2013[4]
San Onofre 2, 3	2,246	Dec. 31, 2022	Retired June 7, 2013[5]
Haynes 5, 6	535	Dec. 31, 2013	Retired June 13, 2013[6]
El Segundo 3	335	Dec. 31, 2015	Retired July 27, 2013[7]
Morro Bay 3, 4	650	Dec. 31, 2015	Retired Feb. 5, 2014
El Segundo 4	335	Dec. 31, 2015	Retired Dec. 31, 2015
Scattergood 3	497	Dec. 31, 2015	Retired Dec. 31, 2015
Pittsburg	1,159	Dec. 31, 2017	Operations ceased Dec. 31, 2016
Moss Landing 6, 7	1,509	Dec. 31, 2020	Retired Jan. 1, 2017
Encina 1	106	Dec. 31, 2017	Retired Mar. 1, 2017
Mandalay 1, 2	430	Dec. 31, 2020	Retired Feb. 5, 2018
Encina 2-5	844	Dec. 31, 2018	Retired Dec. 11, 2018
Redondo Beach 7	493	Dec. 31, 2020	Retired Oct. 1, 2019
Alamitos 1, 2, 6	848	Dec. 31, 2020	Retired Dec. 31, 2019
Huntington Beach 1	215	Dec. 31, 2020	Retired Dec. 31, 2019
Moss Landing 1, 2	1,020	Dec. 31, 2020	Complied Oct. 23, 2020[8]
Total Capacity (MW)	12,985	--	--

[3] Huntington Beach Units 3 and 4 were converted to synchronous condensers in 2013. Once-through cooling water was used in a limited capacity until September 30, 2018.
[4] Although NRG retired Contra Costa Units 6-7, the Marsh Landing facility was constructed immediately next to the retired facility. The Marsh Landing Generating Station is a non-OTC generating facility.
[5] SONGS Units 2 and 3 were officially retired June 7, 2013, but they ceased power generation on Jan. 31, 2012.
[6] LADWP retired Haynes Units 5-6 and replaced them with Haynes Units 11-16, which do not use OTC technology.
[7] NRG retired El Segundo Unit 3 and replaced it with El Segundo Units 5-8, which do not use OTC technology.
[8] Dynegy Moss Landing complied with Track 2 of the OTC Policy.

Table 2 reflects the current compliance plans for the remaining power generating units that use ocean water for once-through cooling. Table 3 presents recent performance of the OTC units in percent of annual capacity factors. The annual capacity factor is defined as the ratio of the electrical energy produced by a generating unit for the year divided by the maximum energy that could have been produced at continuous full power operation. The capacity factor provides one indication of how a generating unit is utilized. Generating units used to meet peak power needs typically have lower capacity factors. The capacity of most of the remaining OTC plants is only used a small percentage of the time, but this capacity helps serve demand during peak hours and stressed operating conditions. Some of the capacity at these plants will need to be replaced to ensure system and local reliability.

Table 2: OTC Compliance Plans for Remaining Units

Facilities and Units	**NQC (MW) as of 12/2020**	**OTC Policy Scheduled Compliance Date**	**Owner Proposed Compliance Method**
Alamitos 3, 4, 5	1,137	Dec. 31, 2023	Plans to retire and replace units by compliance date
Harbor 5	229	Dec. 31, 2029	Plans to comply by Dec. 31, 2029[9]
Haynes 1, 2	444	Dec. 31, 2029	Plans to comply by Dec. 31, 2029
Haynes 8	575	Dec. 31, 2029	Plans to comply by Dec. 31, 2029
Huntington Beach 2	226	Dec. 31, 2023	Plans to retire and replace unit by compliance date
Ormond Beach 1, 2	1,491	Dec. 31, 2023	Plans to retire units by compliance date
Redondo Beach 5, 6, 8	834	Dec. 31, 2021	Plans to retire units by compliance date
Scattergood 1, 2	367	Dec. 31, 2024	Project pending
Total Capacity (MW)	5,303	--	--

[9] In February 2019, the City of Los Angeles Mayor Eric Garcetti announced that LADWP will replace the OTC units with alternative renewable alternatives and LADWP has embarked on studies to assist in the determination of alternative(s) for future repower to replace the remaining OTC units at the Harbor, Haynes, and Scattergood Generating Stations.

Table 3: Recent Performance of OTC Generating Units

CAISO Balancing Authority Area Facilities and Units	OTC Policy Scheduled Compliance Date	NQC (MW)	Annual Capacity Factors (Percent)					
			2014	2015	2016	2017	2018	2019
Alamitos 1	Dec. 31, 2020	175	1.40	3.00	2.00	2.70	2.09	1.81
Alamitos 2	Dec. 31, 2020	175	5.40	6.10	3.40	4.17	5.71	2.72
Alamitos 3	Dec. 31, 2023	321	16.60	10.80	10.40	6.67	10.13	5.58
Alamitos 4	Dec. 31, 2023	336	18.70	7.00	9.90	8.78	9.60	5.59
Alamitos 5	Dec. 31, 2023	480	1.70	3.40	1.90	3.06	2.93	1.24
Alamitos 6	Dec. 31, 2020	485	4.50	6.20	2.70	4.23	3.58	3.32
Huntington Beach 2	Dec. 31, 2023	226	26.20	19.40	12.40	9.03	6.99	4.12
Moss Landing 1	Dec. 31, 2020	510	39.20	35.50	24.60	24.73	44.64	56.80
Moss Landing 2	Dec. 31, 2020	510	47.00	37.00	26.10	24.83	43.46	53.57
Ormond Beach 1	Dec. 31, 2023	741	0.80	2.50	0.70	1.64	1.31	0.55
Ormond Beach 2	Dec. 31, 2023	750	2.40	3.20	0.80	1.75	1.28	1.63
Redondo Beach 5	Dec. 31, 2021	179	2.30	3.50	1.40	2.52	2.04	1.94
Redondo Beach 6	Dec. 31, 2021	175	2.10	4.20	3.10	4.18	1.67	2.50
Redondo Beach 8	Dec. 31, 2021	480	3.30	3.90	1.70	3.99	2.79	1.88
LADWP Balancing Authority Area Facilities and Units								
Harbor 5	Dec. 31, 2029	75	3.30	2.40	4.00	2.29	1.01	3.40

CAISO Balancing Authority Area Facilities and Units	OTC Policy Scheduled Compliance Date	NQC (MW)	Annual Capacity Factors (Percent)					
			2014	2015	2016	2017	2018	2019
Haynes 1	Dec. 31, 2029	230	12.70	6.50	12.30	3.45	1.64	4.05
Haynes 2	Dec. 31, 2029	230	13.10	8.00	16.00	5.34	1.13	1.18
Haynes 8	Dec. 31, 2029	264	34.20	38.00	40.90	39.56	45.39	39.22
Scattergood 1	Dec. 31, 2024	163	24.50	8.30	22.90	5.32	4.47	3.62
Scattergood 2	Dec. 31, 2024	163	6.60	21.20	5.90	2.09	2.38	6.62

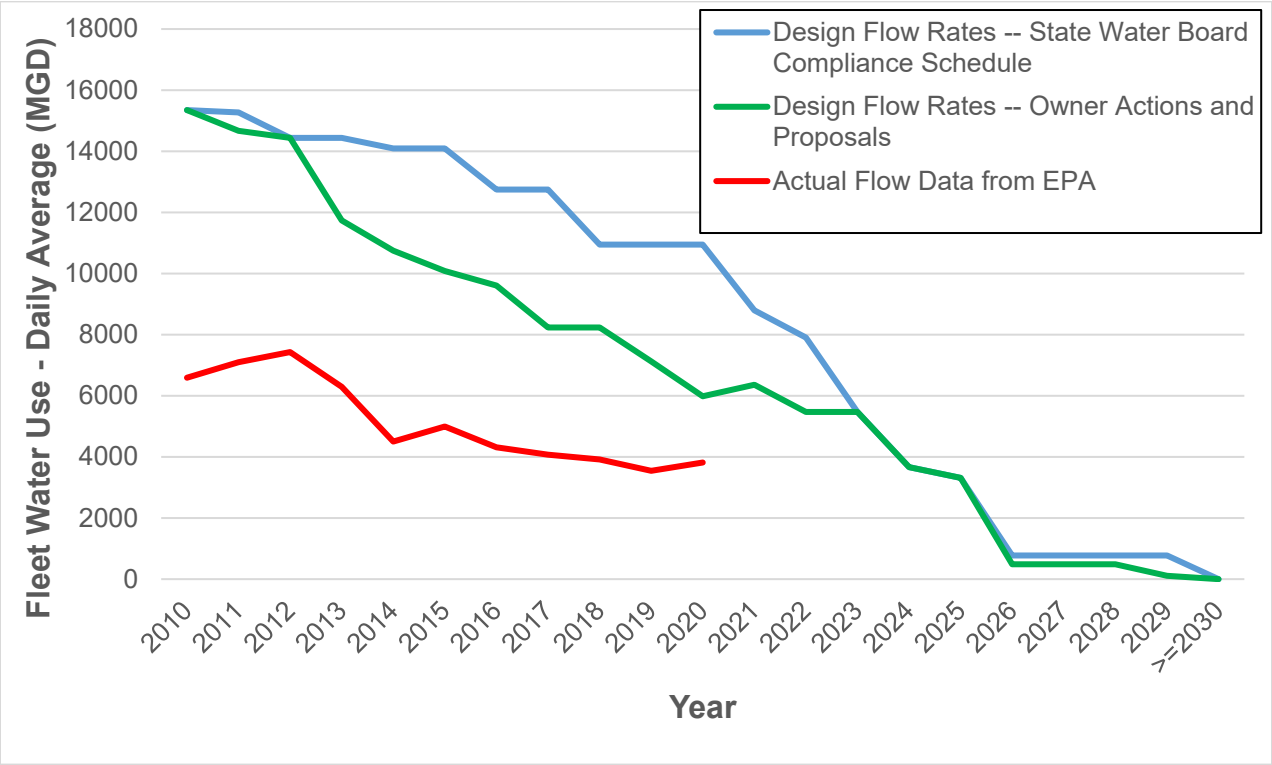
Source: California Energy Commission, Quarterly Fuel and Energy Report, December 2019.

Once-Through Cooling Water Use

There are a number of perspectives from which to assess the impact of the OTC power generating plants (OTC fleet) on impingement and entrainment of marine and estuarine aquatic life. All direct biological measures are beyond the scope of the SACCWIS' responsibility. However, Figures 1 and 2 offer an indicator of environmental impact using ocean or estuarine water flow rates as the metric through time, where Figure 1 shows flow without an extension of Redondo Beach and Figure 2 shows flow with an extension of Redondo Beach. The uppermost line in blue shows the reduction in design water flow based on the OTC Policy compliance schedule as most recently amended and adopted by the State Water Board. The green line shows the aggregate water flow using design flow rates based on the actual retirement dates and expected retirement dates. The red line shows actual flow rates from the OTC fleet. See Appendix A for actual flow rate data.

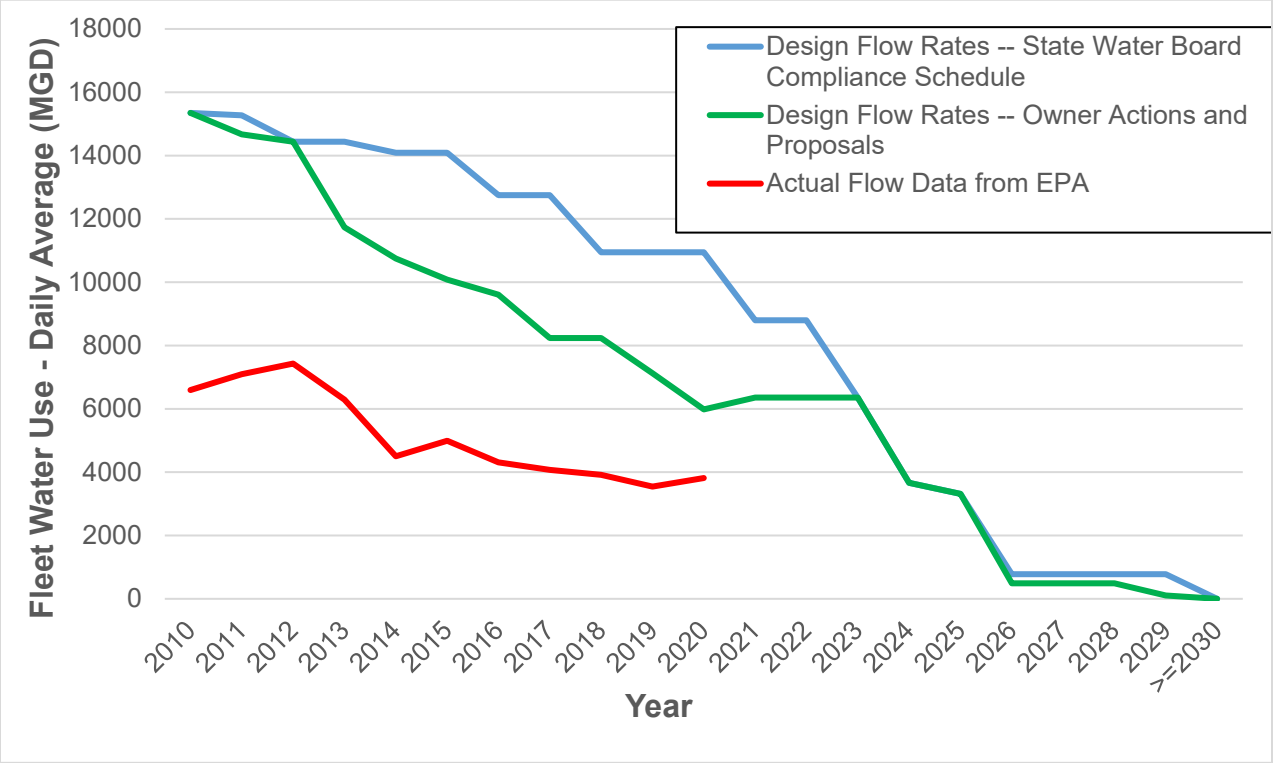
The red line is far below the two upper lines because virtually all fossil fuel OTC facilities are operating with annual capacity factors far below power plant permit expectations (the source of the design condition flow rates). In addition, SONGS and several other OTC facilities retired well before their OTC compliance date, thus creating accelerated environmental benefits compared to the original compliance schedule.

Figure 1: Historic and Projected Water Usage by the Combined OTC Fleet Without a Redondo Beach Extension



Source: CEC and State Water Board Staff, Updated February 17, 2021

Figure 2: Historic and Projected Water Usage by the Combined OTC Fleet With a Redondo Beach Extension



Source: CEC and State Water Board Staff, Updated March 3, 2021

III. Grid Resource and Infrastructure Planning and Status

The CPUC's Long-Term Procurement Plan (LTPP) proceeding evaluated generation resources in the CAISO system every two years, most recently in 2015. The intent was to evaluate whether existing and projected resources are sufficient to meet future demand, and to authorize procurement of additional resources in the event that they are insufficient. Retirement schedules for OTC generating facilities were incorporated into this analysis and updated according to progress towards or changes in retirement deadlines. In addition to system-wide analyses, the LTPP also evaluated capacity requirements in localized, high-demand areas. The CPUC has now implemented its Integrated Resource Planning (IRP) process in response to the legislative requirements of Senate Bill 350 (De Leon, Chapter 547, Statutes of 2015), which serves as a successor to LTPP and includes the function of periodically evaluating generation resources in the CAISO system.[10]

The CEC is the lead agency for licensing fossil fuel power plants 50 MW and larger and has a regulatory certification process under the California Environmental Quality Act. Under this process, the CEC conducts an environmental analysis of each project's Application for Certification (AFC) including an analysis of alternatives and mitigation measures to minimize any significant adverse effect the project may have on the environment. These requirements do not apply to the repowering or replacement of an existing power plant wherein the net increase in capacity is less than 50 MW.

Tables 4 through 7 show the different authorizations and approvals of electric capacity procurement for the Southern California Area. The different tracks reflect the separate procurement authorizations under the CPUC's most recent full LTPP proceeding, R.12-03-014. Track 1 procurement stems from D.13-02-015, which outlined requirements in the West Los Angeles Basin and Big Creek/Ventura local reliability areas. Track 8 procurement stems from D.14-03-004, which outlined additional requirements in the West Los Angeles Basin and San Diego/Imperial Valley local reliability areas in response to the

[10] The combined IRP-LTPP proceeding is R.16-02-007.

retirement of the SONGS. The use of the term "track" in this context is different from the two tracks for compliance with the OTC Policy.

Table 4: Southern California Edison Current Authorizations

Resource Type	Track 1 LCR[11] (West LA Basin) MW	Track 1 LCR (Big Creek/ Ventura) MW	Additional Track 4 Authorization (West LA Basin) MW	Total Authorization MW	Approved Applications MW
Preferred Resources[12] & Energy Storage (Minimum)	200	--	400	600	565[13]
Gas-fired Generation (Minimum)	1,000	--	--	1,000	1,000
Optional: Preferred Resources/ Storage	Up to 400	--	--	Up to 400	0
Optional: Any Resource	200	--	100 to 300	300 to 500	382
Required: Any Resource	--	215 (minimum) to 290	--	215 (minimum) to 290	207[14]
Total	1,400 to 1,800	215 to 290	500 to 700	2,115 to 2,790	2,154

[11] Local Capacity Requirement (LCR)
[12] Preferred resources are those used for energy efficiency, demand response, renewable resources, and distributed generation. Preferred resources are described in the 2005 State Energy Action Plan II.
[13] Includes roughly 27 MW of storage capacity authorized by Resolution E-4804 to alleviate constraints in Southern California due to the Aliso Canyon gas storage facility outage.
[14] Includes the 100 MW Strata Saticoy storage project approved in D.19-12-055 and 95 MW of storage and demand response resources (with the option for an additional 20 MW from one storage resource) approved in Resolution E-5033, which replaced the 262 MW Puente Power Project that was approved in D.16-05-050 and subsequently cancelled.

Table 5: Southern California Edison Approved Applications[15]

Resource Type	Location	Capacity MW	Status
Demand Response	Big Creek/Ventura	14	Approved[16]
Demand Response	West LA Basin	5	Approved
Distributed Generation	Big Creek/Ventura	6	Approved
Distributed Solar Generation	Johanna/Santiago	12	Approved
Distributed Solar Generation	West LA Basin	28	Approved
Energy Efficiency	Big Creek/Ventura	6	Approved
Energy Efficiency	Johanna/Santiago	23	Approved
Energy Efficiency	West LA Basin	101	Approved
Energy Storage	Big Creek/Ventura	186	Approved
Energy Storage	Johanna/Santiago	153	Approved
Energy Storage	Long Beach	100	Operational
Energy Storage	West LA Basin	138	Approved
Combined Cycle Gas Turbine	Alamitos	640	Operational
Combined Cycle Gas Turbine	Huntington Beach	644	Operational
Gas Combustion Turbine	Stanton	98	Operational

[15] For additional details, see Southern California Edison application A.14-11-012, A.14-11-016, A.15-12-013, A.16-11-002, Resolution E-4804, and Resolution E-5033.
[16] Approved status indicates that the project has been approved, or that a portion of the capacity (MW) of the associated facility may be operational.

Table 6: San Diego Gas & Electric Current Authorizations

Resource Type	D.13-03-029/ D.14-02-016 MW	Additional Track 4 Authorization MW	Total Authorization MW	Pending & Approved Applications MW
Preferred Resources & Energy Storage	--	200 (Minimum)	300	144.5[17]
Optional: Any Resource	300 (Pio Pico, CA)	300 to 600	600 to 900	800
Total	300	500 to 800	800 to 1,100	944.5

Table 7: San Diego Gas & Electric Approved Applications[18]

Resource Type	Location	Capacity in MW	Status
Demand Response	San Diego/Imperial Valley	4.5	Approved[19]
Energy Efficiency	San Diego/Imperial Valley	19	Approved
Energy Storage	San Diego/Imperial Valley	121	Approved
Gas Combustion Turbine	Carlsbad (Encina site)	500	Operational
Gas Turbine	Pio Pico	300	Operational

[17] Includes roughly 38 MW of storage capacity authorized by Resolution E-4798 to alleviate constraints in Southern California due to the Aliso Canyon gas storage facility outage.
[18] For additional details on approved projects, see San Diego Gas & Electric application A.14-07-009, A.16-03-014, A.17-04-017, and Resolution E-4798.
[19] Approved status indicates that the project has been approved, or that a portion of the capacity (MW) of the associated facility may be operational.

The Alamitos AFC and Huntington Beach Petition to Amend (PTA) Certifications were approved on April 12, 2017, and the projects reached commercial operation in February 2020. The Stanton Energy Reliability Center is one of the projects selected by Southern California Edison (SCE) to meet the Western Los Angeles Basin local capacity requirements, and reached commercial operation in July 2020. The Redondo Beach AFC was withdrawn by AES on April 7, 2020, and on June 3, 2020, the Energy Commission's Presiding Member terminated the proceeding for the Redondo Beach AFC. The NRG Puente Power Project AFC was withdrawn by NRG on December 7, 2018, and will now be replaced with a suite of alternatives.[20] On December 11, 2018, the Energy Commission's Presiding Member terminated the proceeding for the NRG Puente Power Project AFC.[21] Following solicitations by SCE to replace the Puente Power Project, the CPUC approved 195 MW of storage and demand response capacity in D.19-12-055 and Resolution E-5033.

In addition to its work supporting the CPUC LTPP and now the IRP proceeding, the CAISO expanded its transmission planning process to explore transmission alternatives for improving reliability to the local capacity areas affected by the retirements of OTC generating units. The CAISO approved several transmission upgrades and additions in its 2013-2014 transmission planning process to help address Local Capacity Requirements (LCR) issues associated with the compliance schedule under the OTC Policy and the closure of SONGS. The timing of the CAISO-approved transmission projects and CPUC projects, as well as authorized procurement levels for SCE and San Diego Gas & Electric (SDG&E), facilitate attainment of the compliance schedule of the OTC Policy.

The CAISO's analysis in the 2019-2020 Transmission Plan[22] indicated that the authorized resources and previously-approved transmission projects are working together to meet

[20] The Puente Power Project was a replacement project for the Mandalay Power Plant. The suite of alternatives includes: transmission upgrades, additional energy efficiency, demand response, and battery storage.
[21] The 2018-2019 Transmission Plan is available on CAISO's website.
[22] Draft plans and appendices of the 2018-2019 Transmission Plan are available on CAISO's website.

the reliability needs in the Los Angeles Basin and San Diego areas. Due to the delay of the Carlsbad Energy Center Project, the CAISO conducted a 2018 summer reliability study to assess risk to the Los Angeles Basin and San Diego-Imperial Valley local reliability areas. The assessment culminated in the Encina Power Station 2018 Reliability Study.[23] This study was completed at the end of 2016 and was the basis for amending the OTC Policy to defer the compliance date for Encina Units 2, 3, 4, and 5 by one year to 2018.

The following provides a summary of the reliability transmission projects approved by the CAISO Board of Governors in the 2012-2013, 2013-2014, 2014-2015, 2015-2016, and 2016-2017 Transmission Plans[24] to address reliability concerns related to the retirement of SONGS and OTC generating facilities in the Los Angeles Basin and San Diego local areas. In Table 8, the target in-service date and responsible Participating Transmission Owner (PTO) are identified.

Table 8: In-Service Dates for CAISO Board Approved Transmission Projects

	Transmission Projects	**PTO Service Territory**	**Target In-Service Dates**
1	Talega Synchronous Condensers (2x225 MVAR)	SDG&E	In-Service (8/7/2015)
2	San Luis Rey Synchronous Condensers (2x225 MVAR)	SDG&E	In-Service (12/29/2017)
3	Imperial Valley Phase Shifting Transformers (2x400 MVAR)	SDG&E	In-Service (5/1/2017)
4	Sycamore – Peñasquitos 230kV Line	SDG&E	In-Service (8/29/2018)
5	San Onofre Synchronous Condensers (1x225 MVAR)	SDG&E	In-Service (10/16/2018)

[23] The SACCWIS' Encina Power Station 2018 Reliability Study is available on the State Water Board's website.
[24] Transmission plans are found on the CAISO's website as follows: 2012-2013 Transmission Plan; 2013-2014 Transmission Plan; 2014-2015 Transmission Plan; 2015-2016 Transmission Plan; 2016-2017 Transmission Plan.

	Transmission Projects	PTO Service Territory	Target In-Service Dates
6	Miguel VAR Support (450 MVAR)	SDG&E	In-Service (4/28/2017)
7	Santiago Synchronous Condensers (3x81 MVAR)	SCE	In-Service (12/8/2017)
8	Mesa Loop-In Project and South of Mesa 230kV Line Upgrades	SCE	3/31/2022
9	Extension of Huntington Beach Unit 3 Synchronous Condenser (140 MVAR)	SCE	RMR contract extended and expired on 12/31/2017[25]

Mesa Loop-In Substation Project

The Mesa Loop-In Substation Project operational date is delayed until 2022. SCE filed an application for a Permit to Construct (PTC) the Mesa Loop-In Substation Project with the CPUC on March 13, 2015. On February 9, 2017, SCE received the PTC from the CPUC. SCE received the first Notice to Proceed from the CPUC on September 27, 2017, and the second Notice to Proceed for the remaining scope of work (remaining substation, satellite substation work, telecom scope of work) on November 15, 2017. Construction of the project commenced on October 2, 2017. The current schedule forecasts a March 2022 in-service date as noted in the SCE 10Q and Federal Energy Regulatory Commission (FERC) form 730.

The Mesa 230 kV loop-in portion of the Mesa Loop-In Project has been completed, bringing new power sources to Mesa substation. The 230 kV bus tie breaker is operated in the closed position (while 500kV portion is constructed) to help mitigate loading concerns. Therefore, at this time, the SACCWIS is not recommending an amendment to the OTC Policy to extend compliance dates to provide grid reliability associated with the Mesa Loop-In Substation Project.

[25] The contract for the synchronous condensers expired on Dec. 31, 2017, and they are no longer operating.

CPUC Incremental Capacity Procurement Pursuant to D.19-11-016

On November 7, 2019, the CPUC adopted D.19-11-016 directing procurement of 3,300 MW from load serving entities under the CPUC's jurisdiction to ensure system-wide electric reliability. The decision also recommended that the State Water Board consider revising the OTC Policy to extend the compliance dates for Alamitos Units 3, 4, and 5 for up to three years, Huntington Beach Unit 2 for up to three years, Redondo Beach Units 5, 6, and 8 for up to two years, and Ormond Beach Units 1 and 2 for up to one year. Ultimately the SACCWIS recommended a slight modification to the State Water Board to extend the OTC Policy compliance dates of Alamitos Units 3, 4, and 5 for three years through December 31, 2023, Huntington Beach Unit 2 for three years through December 31, 2023, Ormond Beach Units 1 and 2 for three years through December 31, 2023, and Redondo Beach Units 5, 6, and 8 for one year through December 31, 2021. The modification was in recognition of comments the State Water Board received. The State Water Board received comments regarding impacts from the continued operation of Redondo Beach. The State Water Board also received comments from the Oxnard City Manager on November 18, 2019, noting his support for an extension of Ormond Beach Units 1 and 2 if the City Council and GenOn agree on a plan to perform comprehensive decommissioning, dismantling, and remediation of the site. An amendment to the OTC Policy compliance dates for Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach consistent with recommendation of the SACCWIS was adopted by the State Water Board on September 1, 2020.

The CPUC continues to monitor procurement under D.19-11-016.[26] That decision required 50 percent of the required procurement to be online by August 1, 2021; 75 percent to be online by August 1, 2022; and 100 percent to be online by August 1, 2023. In D.20-12-044, the CPUC established interim milestones and reporting deadlines (September 1, February 1, and August 1) for each procurement tranche.[27]

[26] CPUC D.19-11-016 can be found on the CPUC's website.
[27] CPUC D.20-12-044 can be found on the CPUC's website.

IV. Local Air District Permitting and Rulemaking Activity Affecting Power Plants

In accordance with their 2016 Air Quality Management Plan, the SCAQMD has been working to transition from their local market-based pollutant trading Regional Clean Air Incentives Market (RECLAIM) program back to source-specific command-and-control rules that reflect Best Available Retrofit Control Technology (BARCT). All of the OTC power plants in SCAQMD participate in RECLAIM.[28]

Amendments to Rule 1135 for electric generating facilities were adopted in 2018 to reflect BARCT. The rule currently exempts OTC power plants from the BARCT standards through their OTC Policy compliance dates, including approved extensions, as long as other applicable air quality rule requirements are satisfied. Presently, emission offset requirements for OTC power plants undergoing repower are satisfied through access to SCAQMD's internal offset bank on a fee basis through provisions in Rules 1304 and 1304.1. Although RECLAIM program transition work is ongoing, SCAQMD currently does not have plans to change the eligibility of these plants' access to the internal offset bank, and to date U.S. EPA has not requested any changes with respect to power plants.

SCAQMD plans to amend Rule 1135 in the summer/fall 2021 timeframe, primarily for alignment with U.S. EPA's review of the rule and to update monitoring, recordkeeping, and reporting requirements. Stakeholders could recommend rule changes that may impact OTC repowers at that time. CARB staff will continue to monitor rulemaking activity that could affect power plant operation.

V. Review of Generating Facility Compliance Dates

This section identifies specific issues associated with generating facilities in the CAISO's BAA. These facilities include: Moss Landing, Ormond Beach, Huntington Beach, Alamitos, and Redondo Beach.

[28] Includes AES Alamitos, AES Huntington Beach, AES Redondo Beach, El Segundo Power, LADWP Harbor Generating Station, LADWP Haynes Generating Station, LADWP Scattergood Generating Station.

Moss Landing

Dynegy's Moss Landing facility consists of two types of units – older steam boiler units and new combined cycle units. Units 6 and 7 are steam boilers with a capacity of roughly 750 MW each for a total of 1,510 MW. Units 1 and 2 are combined cycle units. Each 510 MW unit consists of two combustion turbines and a heat recovery steam generator. The final compliance date for Moss Landing under the original OTC Policy was December 31, 2017. In a signed settlement agreement on October 9, 2014, between Dynegy and the State Water Board, staff committed to seek an OTC compliance date extension through December 31, 2020, for Units 1, 2, 6, and 7. On April 7, 2015, the State Water Board adopted the OTC Policy amendment (Resolution No. 2015-0018) to extend the compliance date to December 31, 2020.

In its November 25, 2013, letter to the State Water Board, Dynegy stated its intent to implement Track 2 for Units 1 and 2 as well as Units 6 and 7. In its November 2014 updated implementation plan, Dynegy again stated its intent to implement Track 2 for Units 1 and 2 and identified its plans to achieve Track 2 compliance through prior flow reduction credits, use of operational controls, and installation of technology controls. Dynegy also stated its intent to implement Track 2 for Units 6 and 7 by December 31, 2020, or to cease operation until compliance was achieved. In its January 5, 2017, letter to the State Water Board, Dynegy indicated that it no longer intended to achieve Track 2 compliance for Units 6 and 7 and instead retired both units. Dynegy subsequently sent an updated implementation plan to the State Water Board and confirmed that Units 6 and 7 were shut down on January 1, 2017.[29]

On August 27, 2020, the CPUC issued Resolution E-5097, which approved a contract with SCE for portions of the energy produced by Moss Landing Units 1 and 2 through 2022.[30] On October 23, 2020, the State Water Board confirmed that Moss Landing

[29] The Dynegy Settlement updated Implementation Plan is available on the State Water Board's website.
[30] CPUC Resolution E-5097 is available on the CPUC's website.

Power Plant was in compliance with the OTC Policy via Track 2 and the terms of the 2014 Settlement entered into by the State Water Board and Dynegy Moss Landing, LLC.

The SACCWIS does not recommend a change in compliance dates for the units at the Moss Landing facility.

Ormond Beach

NRG's Ormond Beach Generating Station consists of two steam boiler units using once-through cooling with a combined capacity of 1,486 MW. An October 9, 2014 settlement agreement between the State Water Board and NRG determined Track 1 to be infeasible. NRG confirmed its intent to retire the facility by its OTC Policy compliance date in its implementation plan update sent to the State Water Board on January 19, 2018. On February 28, 2018, NRG notified the CPUC of its intention to shut down and retire Ormond Beach by October 1, 2018.

However, on September 28, 2018, NRG sent a letter to the CAISO to withdraw the earlier shutdown notice to meet local area reliability needs in 2019 pursuant to D.18-06-030. The CAISO's 2019 Local Capacity Technical Analysis Final Report (released May 15, 2018) identified that at least one Ormond Beach unit is needed to meet local capacity requirements, and this need cannot be addressed with other alternatives in time to meet the 2019 calendar year. As a result, CPUC decision D.18-06-030 required SCE to attempt to sign a contract with NRG for power from Ormond Beach for 2019 and 2020 to meet local capacity requirements. SCE filed an Advice Letter with the CPUC on September 4, 2018, seeking approval of a contract with NRG for power from Ormond Beach Unit 2 from January 1, 2019, through November 30, 2019; this contract was approved by the CPUC on September 26, 2018. On November 5, 2018, SCE filed another Advice Letter seeking approval of a contract with Ormond Beach Unit 2 from December 1, 2019, through December 31, 2020. This contract was approved by the CPUC on March 28, 2019, in Resolution E-4986. Based on the CPUC's decision D.19-11-016, the SACCWIS published a final report on January 23, 2020, recommending an extension of Ormond Beach's compliance date by three years. On August 27, 2020, the CPUC issued Resolution E-5099, which approved a contract with SCE for Ormond Beach

Units 1 and 2 through 2023. On September 1, 2020, the State Water Board amended the OTC Policy, which extended the compliance date for Ormond Beach Units 1 and 2 until December 31, 2023. The National Pollutant Discharge Elimination System (NPDES) permit for this facility was amended to reflect this change, effective January 1, 2021.

At this time, the SACCWIS does not recommend a change in compliance dates for the Ormond Beach facility.

Huntington Beach

AES Huntington Beach consists of four units. Units 3 and 4 retired on October 31, 2012, and were converted to synchronous condensers to provide voltage support in 2013. The synchronous condensers ceased the use of once-through cooling and permanently retired in September 2018. Unit 1 ceased the use of once-through cooling and retired on December 31, 2019. Unit 2 uses once-through cooling and has a capacity of 226 MW.

The Huntington Beach PTA was approved by the CEC on April 12, 2017. AES submitted an application for a 939 MW Combined Cycle Gas Turbine (CCGT) power plant, which was approved by the CEC on October 29, 2014. Subsequently, AES was selected for a Power Purchase Agreement (PPA) for a 644 MW power plant by SCE for the Huntington Beach facility, with different equipment configurations than had been approved by the CEC. The CPUC approved SCE procurement selection of the Huntington Beach repowering project for the Western Los Angeles Basin local capacity needs per D.15-11-041 at the November 19, 2015 CPUC voting meeting. On September 14, 2015, AES submitted a PTA for an 844 MW power plant, comprised of a 644MW CCGT in phase 1 and a 200 MW Single Cycle Gas Turbine (SCGT) in phase 2. The CEC approved the revised project on April 12, 2017.

Huntington Beach was awarded a PPA for 644 MW capacity with an initial date of May 1, 2020. This required the shutdown of one Huntington Beach unit prior to the OTC Policy compliance date due to limited interconnection capacity and to satisfy the SCAQMD rules for new emission sources. Huntington Beach Unit 1 complied with the OTC Policy on December 31, 2019, and the 644 MW CCGT began commercial operation in May 2020. AES does not plan to retrofit any of the existing units with alternate cooling technologies

to comply with Track 1 or utilize any operational or technical measures to comply with Track 2.

In its 2019-2020 transmission planning process reliability studies, the CAISO modeled the proposed 644 MW Huntington Beach repowering to replace the Huntington Beach generating facility after 2020.

In its December 18, 2020 implementation plan update to the State Water Board, AES confirmed its intention to comply with the OTC Policy compliance dates for the Huntington Beach generating unit that uses once-through cooling. A power purchase agreement has been executed with a non-utility Load Serving Entity that would extend the operation of Huntington Beach Unit 2 through December 31, 2023. Units 1, 3, and 4 have shut down to enable the new combined-cycle gas turbine (CCGT) at Huntington Beach to be placed in service. The Huntington Beach Phase 1 CCGT completed construction and began commercial operations as of February 4, 2020. On September 1, 2020, the State Water Board amended the OTC Policy, which extended the compliance date for Huntington Beach Unit 2 until December 31, 2023.

At this time, the SACCWIS does not recommend a change in compliance dates for the Huntington Beach facility.

Alamitos

Alamitos consists of six units using once-through cooling. Total capacity of these units is approximately 2,000 MW. In its December 18, 2020 update to their implementation plan, AES confirmed its intention to comply with the OTC compliance dates for the Alamitos generating units that utilize once-through cooling by utilizing Track 1 and shutting down and permanently retiring these units.

On December 27, 2013, AES filed an AFC with the CEC to repower the facility with four 3-on-1 CCGTs with a net generating capacity of 1,936 MW. On October 26, 2015, AES submitted a Supplemental Application for Certification, replacing the prior application, for a 1,040 MW power plant, comprised of a 640 MW CCGT in phase 1 and a 400 MW SCGT in phase 2. The CEC approved the project on April 12, 2017.

AES Alamitos was awarded a PPA for 640 MW of CCGT and 100 MW of energy storage capacity, and commercial operation began on June 1, 2020, and January 1, 2021, respectively. AES continues to pursue contracts and approvals for the additional 200 MW of storage and 400 MW of gas peakers. In its December 18, 2020, update to the State Water Board, AES stated there are currently no plans to proceed with the Phase 2 SCGT at Alamitos.

Alamitos generating units 1, 2, and 6 retired on December 31, 2019, to provide emission offsets for the new 640 MW CCGT, which began commercial operations as of February 4, 2020. AES does not plan to retrofit any of the existing units with alternate cooling technologies to comply with Track 1 or utilize any operational or technical measures to comply with Track 2. A resource adequacy contract has been executed with SCE that would extend the operation of Alamitos Units 3, 4, and 5 through December 31, 2023. The contract received final approval from the CPUC on August 27, 2020.[31] On September 1, 2020, the OTC Policy was amended to continue the operations of Alamitos Units 3, 4, and 5 until December 31, 2023. The NPDES Permit was amended and Time Schedule Order (TSO) approved to reflect this change, effective January 1, 2021. Further, the San Gabriel River Metals Total Maximum Daily Load has been amended and a contract with SCE has been approved to allow for continued operation of Alamitos Units 3, 4, or 5 until their compliance date of December 31, 2023 (see Resolution E-5098).[32]

In its 2019-2020 transmission planning studies, the CAISO modeled the proposed 640 MW Alamitos Energy Center to replace Alamitos OTC generation after 2020. An extension of the compliance date has been approved to meet local capacity needs in the Western LA Basin due to the delay of the Mesa Loop-In Project as well as CAISO system capacity needs.

At this time, the SACCWIS does not recommend a change in compliance dates for the Alamitos facility.

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[31] The resource adequacy contracts for the Alamitos units received CPUC approval on September 28, 2017.
[32] CPUC Resolution E-5098 is available on the CPUC's website.

Redondo Beach

Redondo Beach consists of four units using once-through cooling. The total capacity of these units is approximately 1,300 MW. In its December 18, 2020, update to their implementation plan, AES reaffirmed its intent to comply with Track 1 of the OTC Policy and to shut down and permanently retire all generating units at Redondo Beach per the compliance dates included in the OTC Policy.

Unit 7 was shut down on September 30, 2019, in advance of the OTC Policy compliance date to accommodate the provision of SCAQMD Rule 1304(a)(2) for offset exemptions for the new Huntington Beach CCGT. Redondo Beach has executed power purchase agreements with 16 non-utility Load Serving Entities for Units 5, 6 and 8 through December 31, 2021.

In 2013, AES proposed to repower the Redondo Beach facility in order to comply with the OTC Policy. The proposed repowering project is a natural-gas fired, combined-cycle, air-cooled electrical generating facility with a net generating capacity of 496 MW. As detailed later in this report, AES' AFC at the CEC is suspended. AES proposed alternative land use of the site, the CEC suspended the application on September 2, 2014, and a ballot initiative with the City of Redondo Beach to rezone the property to allow commercial and residential usage including a hotel occurred on March 3, 2015. The voters of the City of Redondo Beach rejected the ballot initiative to redevelop the property, resulting in AES resuming permitting efforts to repower the facility. On November 6, 2015, AES and the City of Redondo Beach filed a petition with the CEC requesting that the AFC proceeding be suspended until August 1, 2016. On November 25, 2015, the CEC suspended the proceedings, but stated that the suspension will remain in place until the applicant or other party makes a motion to reopen the proceeding and the CPUC grants the requested reopening. In early 2016, AES placed the power plant and its 51-acre site on the commercial real estate market. On August 12, 2016, AES and the City of Redondo Beach submitted a notice of agreement to continue the suspension until February 1, 2017. On March 30, 2020, AES closed on the sale of the Redondo Beach site, and AES withdrew the AFC on April 7, 2020.

On September 1, 2020, the OTC Policy was amended to continue the operations of Redondo Beach Units 5, 6, and 8 until December 31, 2021. The NPDES Permit was amended and TSO approved, effective January 1, 2021.

Previously, the CPUC, CAISO, and CEC indicated that a request for extending Redondo Beach's compliance date may be necessary depending on the pace and success of incremental procurement authorized by the CPUC. Additionally, in amending the OTC Policy on September 1, 2020, the State Water Board recognized in finding twenty of the adopting resolution (Resolution No. 2020-0029) that the CPUC, CAISO, and CEC may be revising their forecasting models to account for unexpectedly high peak energy demands during widespread extreme high temperatures, and may determine that there is a need to request additional extensions of compliance dates to maintain grid reliability and avoid rolling blackouts in the future.

At this time, the SACCWIS recommends an OTC Policy compliance date extension for Redondo Beach for two years, through December 31, 2023, to address system-wide grid reliability needs as described below.

VI. System-Wide Grid Reliability Concerns and Need for Redondo Beach Generating Stations' Operation Through 2023

The CPUC, CAISO, and CEC all have critical roles in ensuring reliability for California's electrical system. The three agencies continue to collaborate to study electric reliability issues associated with the compliance schedule under the OTC Policy. The CPUC considers procurement authorizations for its jurisdictional load serving entities; the CAISO conducts reliability analysis and examines infrastructure upgrades and additions in its transmission planning process; and the CEC evaluates and, when necessary, issues licenses to site new generation resources.

Final Root Cause Analysis and Recent Backstop Actions

In August 2020, swaths of the western United States encountered a prolonged and extreme heat storm. This led to a series of circumstances that ultimately required the CAISO to initiate rotating outages in its BAA to prevent wide-spread service interruptions. Subsequent to these outages, Governor Gavin Newsom directed the CPUC, CAISO, and

CEC to publish a report identifying the root cause of the events leading to these outages. Consistent with this directive, the CPUC, CAISO, and CEC published a Final Root Cause Analysis report on January 13, 2021.[33] The Final Root Cause Analysis points to three main factors that led to these outages, which are discussed in greater detail below along with recent backstop actions.

1. **"The climate change-induced extreme heat wave across the western United States resulted in demand for electricity exceeding existing electricity resource adequacy (RA) and planning targets.** Taking into account 35 years of weather data, the extreme heat wave experienced in August was a 1-in-30 year weather event in California. In addition, this climate change-induced extreme heat wave extended across the western United States. The resulting demand for electricity exceeded the existing electricity resource planning targets and resources in neighboring areas were also strained."[34]

   Although future weather conditions are not known today, climate change-induced impacts could result in a variety of outcomes, including: extreme and prolonged heat waves that drive up demand and cause generator-forced outages; droughts that reduce hydroelectric generation in California and nearby states that export electricity to California; altered weather patterns that reduce wind and solar generation; and wildfires that threaten transmission lines.

   The current 15 percent planning reserve margin (PRM) was not designed to capture the uncertainties related to these scenarios. As a result, increasing the PRM is being considered. The CAISO has proposed for consideration to the CPUC a higher interim PRM of 17.5 percent that would apply both at system peak and at a critical hour after the peak while more substantive reforms are considered. A recent ruling in the

[33] The Final Root Cause Analysis for the Mid-August 2020 Extreme Heat Wave can be found on CAISO's website.
[34] CAISO, CPUC, and CEC, *Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave*, January 13, 2021, pp. 3-4.

CPUC's IRP proceeding proposes using a 20.7 percent PRM at system peak for reliability planning purposes.[35]

The CEC will focus on additional reliability-related actions in the 2021 Integrated Energy Policy Report (IEPR).[36] The general scope of the IEPR addresses both electric reliability and natural gas reliability issues, as well as the development of an electric reliability Contingency Plan.[37] The Contingency Plan is being prepared by the CEC in coordination with the Governor's Office, CPUC, CAISO, and other appropriate state agencies and stakeholders. It will lay out a process to sequence emergency measures in rank order to minimize the potential for outages, while considering environmental, equity, and safety impacts.

2. **"In transitioning to a reliable, clean, and affordable resource mix, resource planning targets have not kept pace to ensure sufficient resources that can be relied upon to meet demand in the early evening hours. This made balancing demand and supply more challenging during the extreme heat wave.** The rotating outages both occurred after the period of gross peak demand, during the "net demand peak," which is the peak of demand net of solar and wind generation resources. With today's new resource mix, behind-the-meter and front-of-meter (utility-scale) solar generation declines in the late afternoon at a faster rate than demand decreases. These changes in the resource mix and the timing of the net peak have increased the challenge of maintaining system reliability, and this challenge is amplified during an extreme heat wave."[38]

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[35] CPUC, Administrative Law Judge's Ruling Seeking Feedback on Mid-Term Reliability Analysis and Proposed Procurement Requirement, Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes, Rulemaking 20-05-003, February 22, 2021.
[36] Additional details are available on the CEC's website.
[37] CAISO, CPUC, and CEC, *Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave*, January 13, 2021, p. 73.
[38] CAISO, CPUC, and CEC, *Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave*, January 13, 2021, p. 4.

The Final Root Cause Analysis lists several actions that will address the contributing factors that caused the August 2020 rotating outages, including "expedit[ing] the regulatory and procurement processes to develop additional resources that can be online by 2021" and to ensure resources are effective during the net demand peak. The CPUC specifically opened R.20-11-003 in November 2020 to establish policies, processes, and rules to ensure reliable electric service in California in the event of an extreme weather event in 2021.[39]

On February 11, 2021, the CPUC adopted D.21-02-028, which directs Pacific Gas and Electric Company, SCE, and SDG&E to procure additional capacity that is effective during the net demand peak for summer 2021.[40] Specifically, the investor-owned utilities (IOUs) were authorized to seek incremental capacity from existing plants, capacity that is at risk of retirement, incremental energy storage, and firm forward imported energy. The CPUC has also solicited party proposals for securing additional demand-side resources that can be available during the net demand peak period for summer 2021 and summer 2022. A subsequent CPUC decision addressing these measures is expected in the coming months.

These resource additions are on top of prior directives from the CPUC that will result in an increase of over 2,200 MW of new battery storage that can help meet the net peak demand by 2022. Most recently, the CPUC released a ruling seeking party comments on whether another 1,800 MW of procurement should be accelerated to be online by August 2023; comments from parties on the feasibility of that expedited procurement are due on March 19, 2021.[41]

3. **"Some practices in the day-ahead energy market exacerbated the supply challenges under highly stressed conditions.** A subset of energy market practices

[39] Documents pertaining to CPUC proceeding R.20-11-003 can be found on CPUC's website.
[40] Additional details are available on the CPUC's website.
[41] CPUC, Administrative Law Judge's Ruling Seeking Feedback on Mid-Term Reliability Analysis and Proposed Procurement Requirement, Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes, Rulemaking 20-05-003, February 22, 2021.

contributed to the inability to obtain or prioritize energy to serve CAISO load in the day-ahead market that could have otherwise relieved the strained conditions on the CAISO grid on August 14 and 15."[42]

In addition, the combination of existing real-time scheduling priorities and a previously implemented market enhancement inadvertently caused the CAISO's markets to fail to account for the obscuring effects of under-scheduling and convergence bidding during August's stressed operating conditions.[43] The CAISO has conducted a market enhancements stakeholder initiative to address the market-related factors identified in the Final Root Cause Analysis and plans to bring the proposals to its Board of Governors for approval in March 2021, with targeted implementation of changes by June 2021.[44]

The CPUC, CAISO, and CEC have been taking decisive action to address each of the above three factors. Although the proposals from each agency have not yet been fully implemented, they continue to collaborate towards the implementation of identified and potential solutions to support system-wide grid reliability; however, a great deal of uncertainty remains. At this point in time it is unclear whether authorized or proposed procurement will be realized and whether such procurement will adequately address the net demand peak period; whether an average level of imports can be delivered, whether actual operating conditions stay within planning targets for load, forced outages and needed operating reserves; whether all existing resources stay online and load serving entities are able to contract for all necessary resources in the CAISO BAA; and whether new and untested programs will perform as anticipated.

In addition to actions taken to address the findings and recommendations of the Final Root Cause Analysis, in 2020 almost 400 MW of resources announced their intent to

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[42] CAISO, CPUC, and CEC, *Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave*, January 13, 2021, p. 5.
[43] CAISO, CPUC, and CEC, *Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave*, January 13, 2021, p. 5.
[44] Details regarding this market enhancements stakeholder initiative are available on the CAISO's website.

retire or mothball from the CAISO system. The first group of announced retirements included approximately 150 MW of cogeneration resources in local capacity areas.[45] Since these resources were needed in their respective local areas for reliability, the CAISO was authorized by its Board of Governors to retain these resources under a cost-based contract to designate these resources as "reliability must run" (RMR) backstop resources. In December 2020, the CAISO Board of Governors approved the first ever system RMR for a 248 MW cogeneration power plant, which is needed to support system-wide reliability needs.[46] Unlike a local RMR, a resource needed for system-level reliability signals that all resources are equally needed to maintain reliability.

System-wide Grid Reliability Analysis

Following the Final Root Cause Analysis, the CPUC, CAISO, and CEC conducted a stack analysis to compare the forecasted demand in 2022 to all of the existing energy producing and load reduction resources and energy producing resources expected to come online by 2022. This analysis was completed by "stacking up" resource capacity values and comparing them to the forecasted demand plus two PRM alternatives. The analysis was conducted based on publicly available data at the time of publication of this report or using average or expected values.

Demand Analysis at the Most Critical Hour

To ensure the stack analysis considered the periods of greatest need, the analysis focused on the most critical hour after peak of the forecasted demand for each month June through October 2022. Demand is typically the highest during these months.

Traditionally, stack analyses focus on the gross demand peak hour. However, with the proliferation of solar resources, both behind-the-meter and grid-connected, the most critical hours the grid typically experiences are now after the peak load period. This period is when load is still relatively high, but intermittent resource generation (such as

[45] See CAISO's website for additional details.
[46] See CAISO's website for additional details.

solar) is below its capacity value and output is rapidly declining, otherwise known as the "net demand peak period" between 4 p.m. and 9 p.m.

To account for this pattern, the CPUC, CAISO and CEC created a stack analysis that addresses declining intermittent generation in the evening hours. For ease of comparison, the hour that ends (hour ending, HE) at 8 p.m. Pacific Daylight Time (PDT) was selected because solar generation is at or near zero by the end of the hour, but the demand remains relatively high compared to the peak. Table 9 shows this relationship. In July and August, the load for HE 8 p.m. PDT is over 600 MW lower than the peak of the month, which occurs an hour or two earlier. For June, September, and October, the difference is much smaller.

Table 9: Comparison of June-October 2022 Peak Demand and Load for HE 8 p.m. PDT (MW)

Month	Peak demand	Peak demand hour ending (PDT)	Load for HE 8 p.m. PDT	Peak demand minus HE 8 p.m. PDT load ([B] - [D])
[A]	[B]	[C]	[D]	[E]
June	41,255	7 p.m.	41,204	51
July	44,424	6 p.m.	43,603	822
August	44,684	6 p.m.	44,009	675
September	45,448	7 p.m.	45,343	105
October	37,036	8 p.m.	37,036	0

Source: California Energy Commission, 2020 Integrated Energy and Policy Report, California Energy Demand Update 2020 Hourly Forecast for CAISO footprint, mid-demand and mid additional achievable energy efficiency case.

Figures 3 through 7 show five illustrative snapshots of renewable generation in the CAISO market during the middle of each month from June through October 2020. Each figure shows that solar generation declines from a peak of approximately 10,000 MW or more to less than 300 MW by 8:00 p.m. PDT (shown in military time 20:00).

Figure 3: Illustrative Snapshot of Renewable Generation in CAISO Footprint mid-June

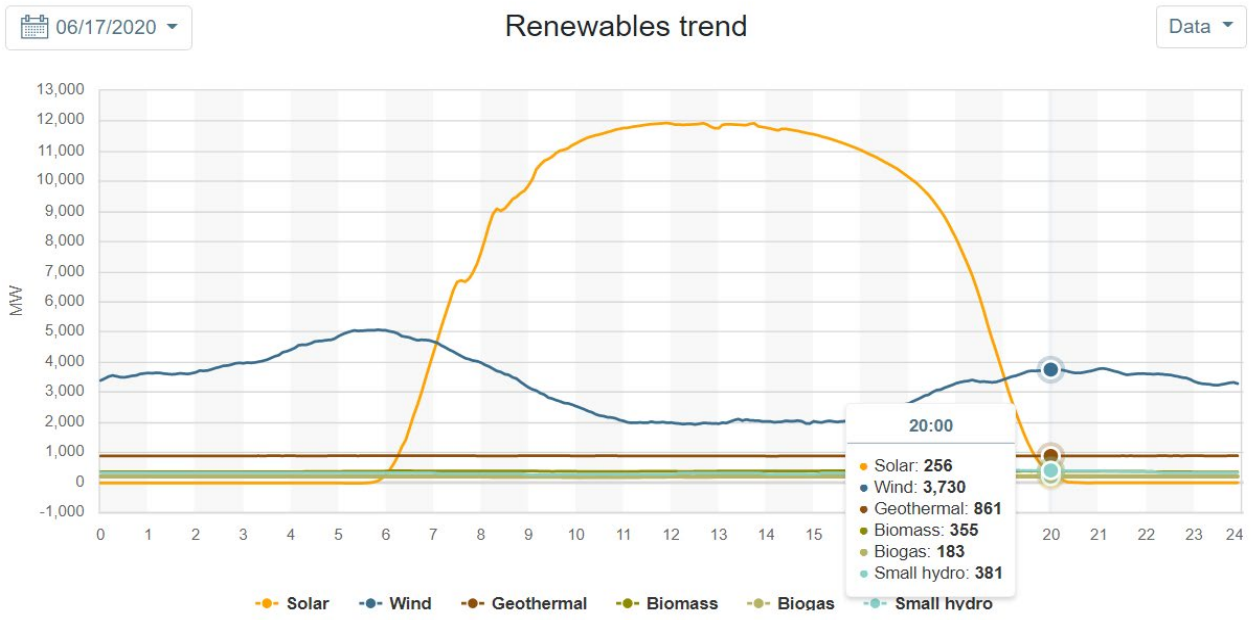


Figure 4: Illustrative Snapshot of Renewable Generation in CAISO Footprint mid-July

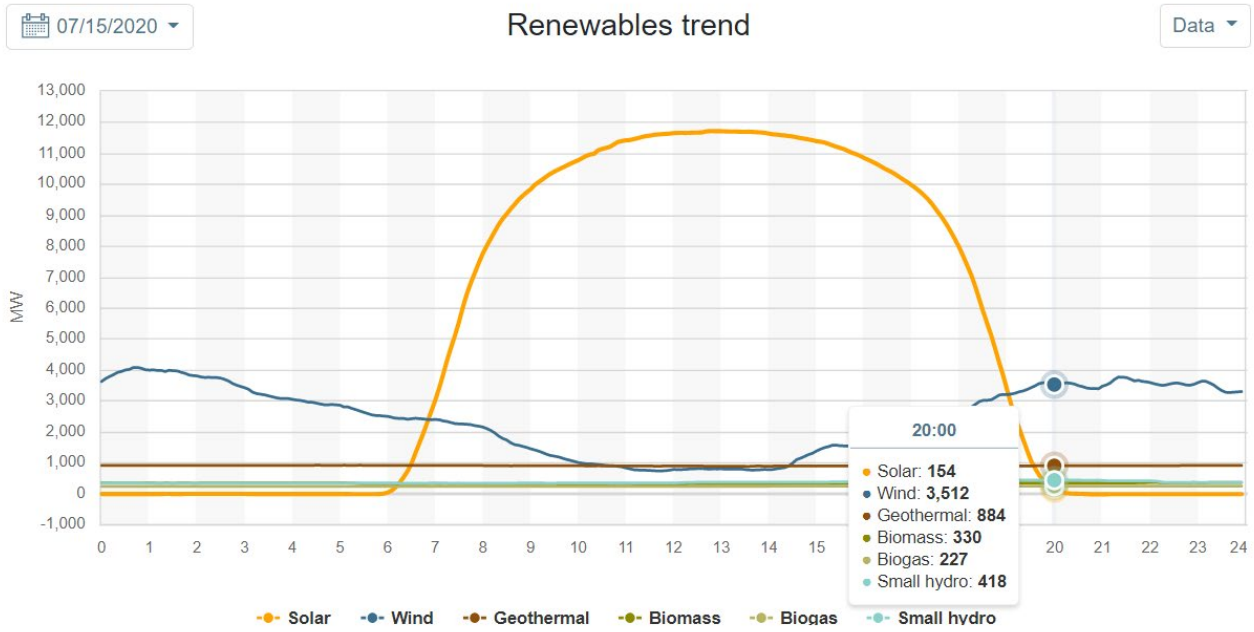


Figure 5: Illustrative Snapshot of Renewable Generation in CAISO Footprint mid-August

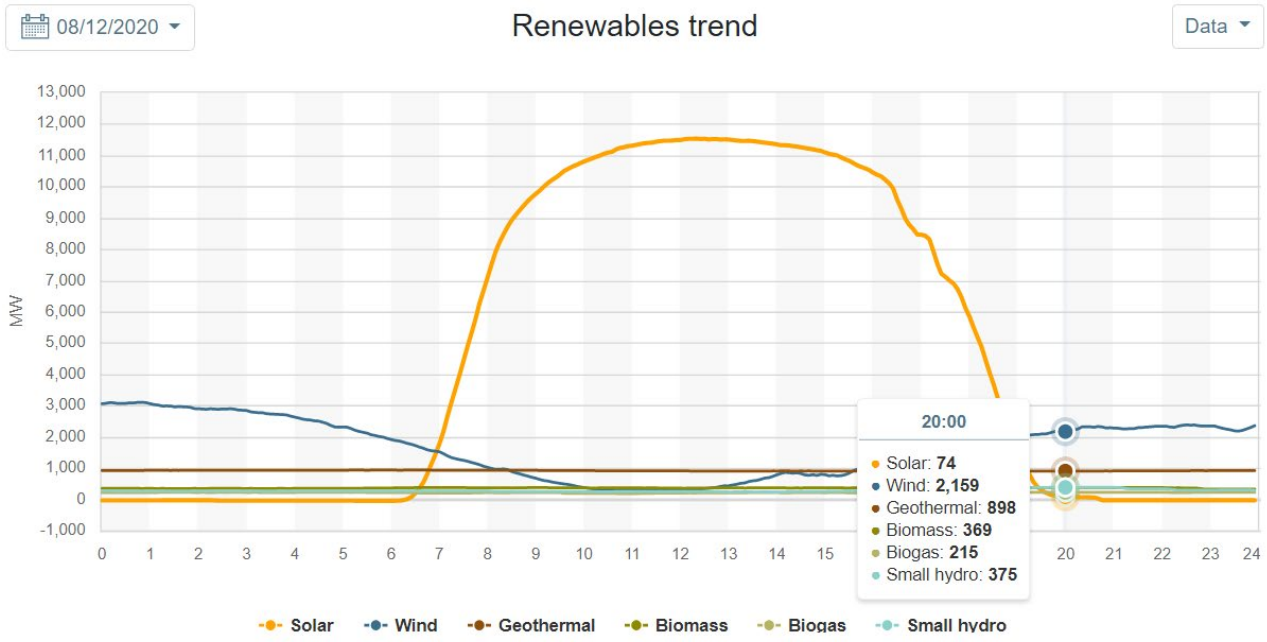


Figure 6: Illustrative Snapshot of Renewable Generation in CAISO Footprint mid-September

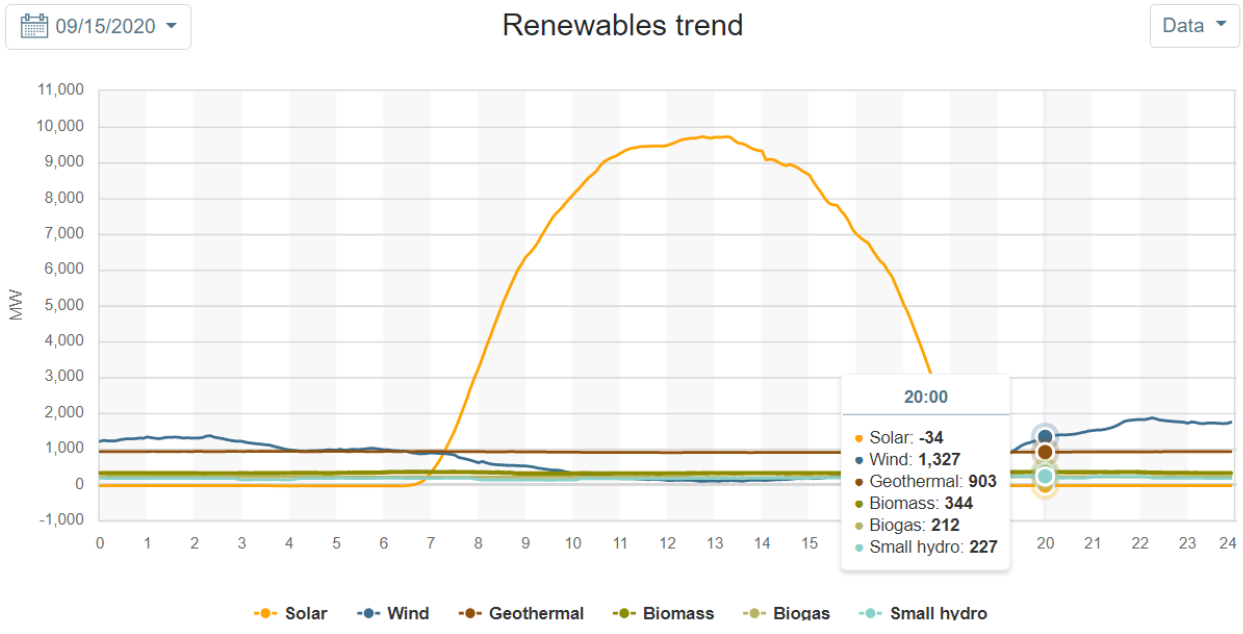
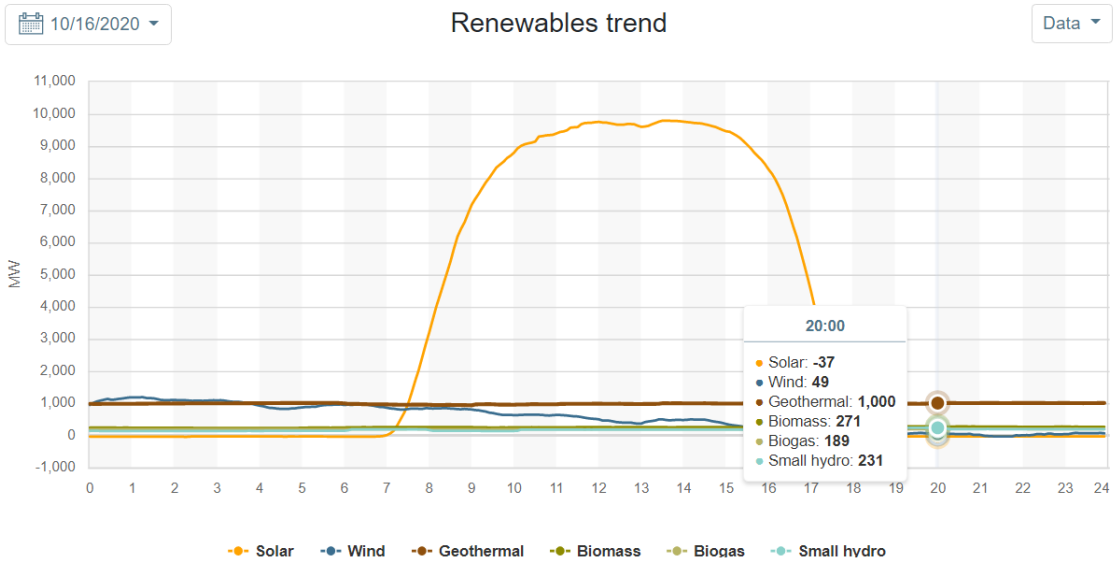


Figure 7: Illustrative Snapshot of Renewable Generation in CAISO Footprint mid-October



Resource Stack Analysis

Detailed assumptions and sources of data for the resource stack analysis described herein are provided in Appendix B.

The stack analysis employed for this exercise reflects zero solar generation recognizing the minimal solar output at the end of the hour, if not over the whole hour, for the HE 8 p.m. PDT in each of the summer months.

For all other existing resources, the analysis used as a starting point the 2021 net qualifying capacity (NQC) values available for each month and assumed the same resources with these NQC values will be available in 2022, except for Redondo Beach. The NQC values reflect the amount of capacity that can be counted towards meeting the load plus PRM. They are based on counting methodologies established by the CPUC and tested for deliverability by the CAISO.

For demand response resources, the Final Root Cause Analysis showed that approximately 50 percent of the demand response procured by the CPUC's jurisdictional

load serving entities was effective during the mid-August rotating outages.[47] The stack analysis assumed an improvement in overall performance to 60 percent of the 2021 NQC value by 2022. For imports, the stack analysis assumed procurement of resource adequacy imports based on the historical average from 2015 through 2020 for each month. This assumption does not consider whether tightening supply conditions in the rest of the west could decrease imports into the CAISO footprint. Imports may decrease due to west-wide heat waves like those experienced during mid-August 2020, drought conditions in neighboring states that reduce the amount of surplus hydroelectric energy available for export, or the retirement of major resources in the rest of the west.

For incremental resources, the stack analysis relied on the CPUC's list of new resources expected to be online by August each year through 2022 (both contracted and uncontracted) to reflect potential supply.[48] This list of resources was developed from a variety of CPUC proceedings. Not all resources were explicitly procured to address the Final Root Cause Analysis findings, and not all of the resources can be counted-on to be effective during the net demand peak period. To address this concern, the stack analysis removed stand-alone solar capacity to reflect little to no generation at HE 8 p.m. PDT, although solar paired with storage is included at its NQC value. All other resources were also assumed to be effective later in the day.

Forecasted Demand and Planning Reserve Margin

All of the existing and incremental resource capacity is "stacked up" and compared to the demand at HE 8 p.m. PDT, plus a PRM. The forecasted demand contained in the stack analysis is based on the 1-in-2 average hourly forecast for June through October 2022, which is derived from the mid-demand and mid-additional achievable energy efficiency scenario from the CEC's 2020 IEPR Update.

[47] CAISO, CPUC, and CEC, *Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave*, January 13, 2021, p. 56.
[48] CPUC Energy Division, *Status of New Resources Expected*, November 2020. See CPUC's website for additional details.

This stack analysis compared two PRM levels. The first is the current 15 percent PRM, comprised of a 6 percent margin for required operating reserves plus a 9 percent margin for the combination of above average load and generation forced outage rates. The second PRM is the CAISO's proposed 17.5 percent PRM, comprised of a 6 percent margin for required operating reserves, 4 percent margin for the difference between a forecasted 1-in-2 and 1-in-5 system demand, and 7.5 percent margin for forced outages based on North American Electric Reliability Corporation Generator Availability Data System data.[49] The 17.5 percent PRM is based on the CAISO's analysis that the current PRM does not fully address the findings in the Final Root Cause Analysis noted above.

Table 10 below provides the numerical comparison between the total resource stack versus the load for HE 8 p.m. PDT, plus a 15 percent and 17.5 percent PRM.

[49] CAISO, Legal and Policy Brief of the California Independent System Operator, CPUC Rulemaking 20-11-003, February 5, 2021. A 1-in-2 forecast reflects a 50 percent probability that the forecasted peak will be less than actual peak load, and a 50 percent probability that the forecasted peak will be greater than actual peak load. A 1-in-5 forecast reflects a 20 percent probability that the forecasted peak load will be greater than actual peak load and reflects an above average load level.

Table 10: Surplus and Shortfall of 2022 Existing and Expected Online Resource Stack Without Redondo Beach as Compared to Load for HE 8 p.m. PDT Plus 15 percent and 17.5 percent PRM (MW)

Month	Existing and expected online resource stack without Redondo Beach	Load for HE 8 p.m. PDT	15% PRM plus load for HE 8 p.m. PDT	17.5% PRM plus load for HE 8 p.m. PDT	Resource stack minus 15% PRM plus load ([B] - [D])	Resource stack minus 17.5% PRM plus load ([B] - [E])
[A]	[B]	[C]	[D]	[E]	[F]	[G]
June	49,466	41,204	47,385	48,415	2,082	1,051
July	50,819	43,603	50,143	51,233	676	(414)
August	52,073	44,009	50,610	51,711	1,463	363
September	50,715	45,343	52,145	53,278	(1,430)	(2,563)
October	47,537	37,036	42,591	43,517	4,946	4,020

Note: In columns [F] and [G], a surplus is shown in black font and a shortfall is shown in red font within parentheses.

Based on only the existing and expected online incremental resources, the results showed shortfalls in September 2022 under both the current 15 percent PRM and the proposed 17.5 percent PRM of 1,430 MW and 2,563 MW, respectively, as well as a smaller 414 MW shortfall in July under the proposed 17.5 percent PRM. This projected shortfall is conservative, as it assumes load serving entities will contract with all existing and incremental resources known today. This assumption also assumes all existing resources today (except Redondo Beach) remain operational through summer 2022, incremental resources come online as expected, and load serving entities are able to contract for all resources within the CAISO BAA plus at least the historical average level of resource adequacy imports.

For all other months, the stack analysis signaled that there may be sufficient NQC available for procurement to satisfy both current and proposed PRM levels if contracted by load serving entities. However, because the resource adequacy program is designed to give load serving entities additional time during the year to layer in additional

procurement for the summer months, the total level of procurement is not known at this time.[50]

Resource Stack Analysis Projections for 2022

Table 11 compares stack analysis projections for September 2022, the month with the largest anticipated shortfall, to CPUC staff estimates for expedited procurement that is effective at the 8 p.m. hour. Assuming the expedited procurement results in 1,500 MW of additional capacity that can effectively address energy needs during the net demand peak, the shortfall in September is potentially reduced to a 70 MW surplus under a 15 percent PRM but still a 1,063 MW shortfall under a 17.5 percent PRM. Note that at the time of publication of this report, the CPUC has not yet voted on additional expedited procurement, and once adopted some of the proposed programs are likely to be new and untested. In addition, some of the resources targeted in that proceeding—such as contracting with resources at risk of retirement and securing contracts for imported energy—overlap with resources that are already counted in other categories of the resource stack. Consequently, the incremental resources that will result from that procurement are estimates only, and there is likely to be a non-trivial level of risk and uncertainty associated with the resources being proposed in that effort.

Table 11 also includes the capacity from Redondo Beach Units 5, 6, and 8 that would be available should the OTC Policy compliance deadline be extended through December 31, 2023. The combination of the capacity potentially available from expedited procurement and from Redondo Beach results in a 900 MW surplus for September 2022 under the current 15 percent PRM. However, there is a 229 MW deficit under the 17.5 percent PRM.

[50] Annual resource adequacy filings are due every October for the following program year to meet 90 percent of the total requirement. 100 percent of the requirement is not due until 45 days before the operating month. In order other words, total procurement for September 2022 will not be fully known until mid-July 2022.

Table 11: Surplus and Shortfall for September 2022 Total Resource Stack as Compared to Load for HE 8 p.m. PDT Plus 15 percent and 17.5 percent PRM (MW)

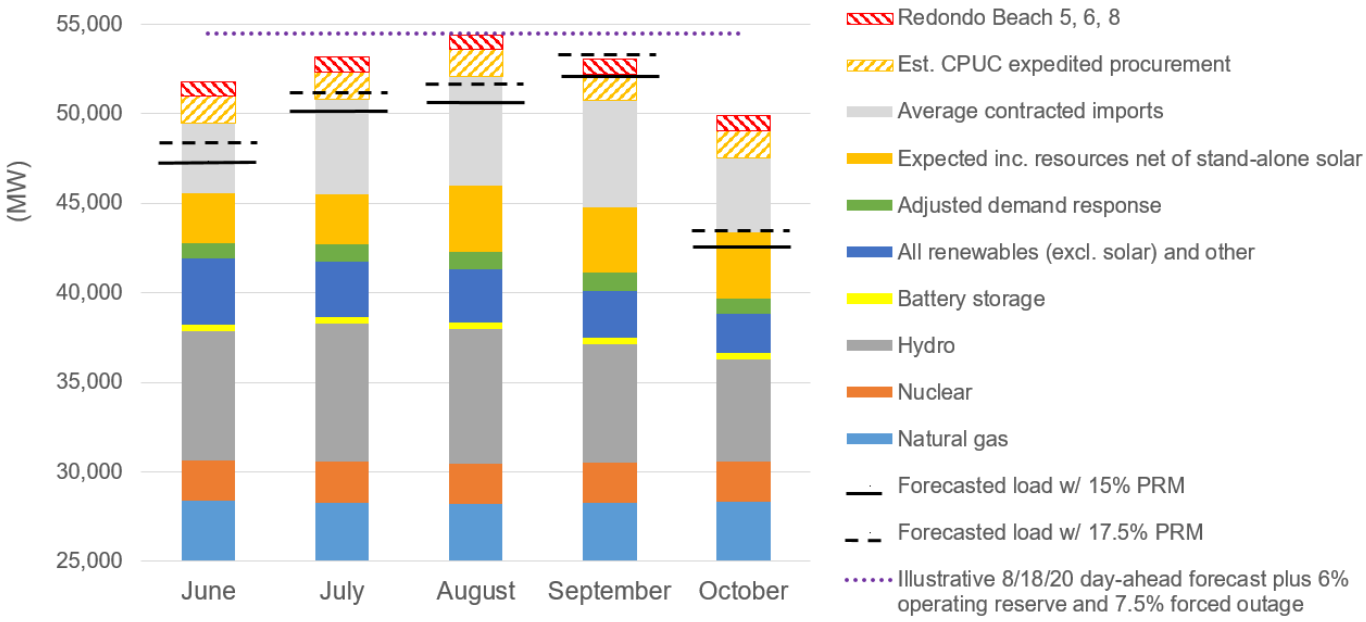
		15% PRM	17.5% PRM
[1]	Existing and expected online resource stack	(1,430)	(2,563)
[2]	Estimated CPUC expedited procurement	1,500	1,500
[3]	Sub-total with only expedited procurement	70	(1,063)
[4]	Redondo Beach Units 5, 6, and 8 (RB)	834	834
[5]	Total with expedited procurement and RB	904	(229)

Note: A surplus is shown in black font and a shortfall is shown in red font within parentheses.

Figure 8 shows stacked resource columns for June through October 2022 compared with the forecasted load for HE 8 p.m. PDT, plus a 15 percent and 17.5 percent PRM for each stack. The figure includes both the estimated CPUC expedited procurement as well as the extension of Redondo Beach Units 5, 6, and 8.

In addition to the projected 2022 stack analysis, Figure 8 also includes a historical comparison based on an actual weather event. On August 18, during the mid-August 2020 heat wave, the day-ahead forecast was projected to be 48,000 MW at HE 8 p.m. PDT. This is over 4,000 MW higher than the projected August 2022 forecast at HE 8 p.m. PDT. Adding in the required 6 percent operating reserves and the CAISO's recommended forced outage rate of 7.5 percent results in a total requirement of 54,480 MW. This requirement is illustrated with a horizontal dotted line. The conditions surrounding this event and level of demand—extended high temperatures and stressed grid conditions throughout the western United States—are representative of the circumstances in which the capacity of Redondo Beach would be most needed.

Figure 8: June – October 2022 Resource Stack vs. Load for HE 8 p.m. PDT Plus 15 percent and 17.5 percent PRM



Projections for 2023

There are several uncertainties in developing a 2023 stack analysis, as neither the 2022 nor 2023 NQC lists are available, current procurement authorizations are either still in progress or not yet approved, and the resource adequacy program continues to evolve. At this time, the CEC's demand forecast is showing approximately 500 MW of load increase at HE 8 p.m. PDT between 2022 and 2023, as shown in Table 12 below.

Table 12: Increase in Forecasted 2023 Load for HE 8 p.m. PDT

Month	2022 Load for HE 8 p.m. PDT	2023 Load for HE 8 p.m. PDT	Increase in 2023 Load ([C] - [B])
[A]	[B]	[C]	[D]
June	41,204	41,610	406
July	43,603	44,031	428
August	44,009	44,406	397
September	45,343	45,826	483
October	37,036	37,589	554

Should the demand for energy increase in 2023 as projected, the power generated by Redondo Beach will be critical to offset system-wide grid shortfalls.

VII. SACCWIS Recommendation and Alternatives

SACCWIS considered the following alternatives to address grid reliability and makes the following recommendation.

Alternative 1 & Recommendation – Extend OTC Compliance Date for Redondo Beach for Two Years

The SACCWIS recommends the State Water Board amend the OTC Policy to extend the compliance date of Redondo Beach Units 5, 6, and 8 for two years from December 31, 2021, to December 31, 2023.

The extension would help meet system reliability needs for September 2022 at HE 8 p.m. PDT as demonstrated by the system-wide grid shortfalls in the 2022 stack analysis. The second year of the extension is necessary to address the uncertainty in the 2023 resource supply stack and the CEC's forecasted 500 MW increase in demand between 2022 and 2023. The stack analysis indicates shortfalls of 1,430 MW under a 15 percent PRM and 2,563 MW under a 17.5 percent PRM, with the only resources online in 2022 being those that currently exist (not including Redondo) and those expected to come online by 2022. Assuming 1,500 MW of additional, expedited procurement comes online on schedule, the power generated by Redondo Beach would help offset a remaining shortfall of 1,063 MW, based on a 17.5 percent PRM. The 17.5 percent PRM is a more conservative reserve margin, in part intended to reduce the risk of power outages when demand is high during west coast-wide heat waves. The addition of 834 MW from Redondo Beach would help meet the demand and significantly offset system-wide grid shortfalls.

Even with an extension of the Redondo Beach compliance date, California may experience black-outs or brown-outs during times when electrical demand is high and imports are unreliable due to similar high demands in other states or BAAs, such as during extreme and prolonged heat waves. However, this risk would be significantly decreased due to the availability of additional power from Redondo Beach.

Furthermore, a two-year extension would minimize the regulatory risk of returning to the State Water Board should the power generated by Redondo Beach be needed in 2023. Should it be determined that there is no need for Redondo Beach in 2023, the unit may retire earlier than its compliance date deadline.

This recommendation follows indications from the CPUC, CAISO, and CEC that a request for extending Redondo Beach's compliance date may be necessary depending on the pace and success of incremental procurement authorized by the CPUC.[51] Additionally, in amending the OTC Policy on September 1, 2020, the State Water Board recognized that "portions of California were subject to rotating power outages during mid-August 2020 due largely to unexpectedly high peak energy demands during widespread extreme high temperatures. The CPUC, CAISO, and CEC may be revising their forecasting models to account for this scenario, and may determine that there is a need to request additional extensions of final compliance dates to maintain grid reliability and avoid similar blackouts in the future."[52]

Since September 1, 2020, critical uncertainties discussed both in this report and in the Final Root Cause Analysis have sparked efforts from the CPUC, CAISO, and CEC to revise their forecasting models and have highlighted the need for additional capacity. Specifically, these uncertainties include:

1. Whether authorized or proposed procurement will adequately address the net demand peak period;
2. Whether imports can be successfully contracted for up to at least the historical average resource adequacy levels despite tightening supply conditions in the rest of the west;
3. Whether resources assumed online today will remain so beyond 2021 and perform as expected;
4. Planning processes have not entirely changed to address high loads and the net demand peak but expedited actions seek to provide a stop-gap;

[51] Additional details are available on the State Water Board's website.
[52] The Resolution is found on the State Water Board's website.

5. Processes that address additional procurement and market changes are still in progress, and once implemented a fair amount of uncertainty regarding their effectiveness will remain; and
6. Lastly, there are a variety of climate-change and real-time conditions that could negatively impact the operation of the fleet but are unknown until much closer to the operational period, such as drought, wildfires threatening generation and transmission infrastructure, and cloud cover which reduces solar output and battery storage charging capability.

The CPUC has authorized new electric resources to replace a portion of the OTC fleet's capacity subject to the OTC Policy, and will continue to monitor this procurement, as well as incremental procurement under D.19-11-016 and R.20-11-003. As part of this process, and pursuant to a request by the State Water Resources Control Board, the CPUC submitted its first quarterly report on D.19-11-016 procurement on March 16, 2021. Additionally, efforts are underway to address the recommendations of the Final Root Cause Analysis of the mid-August rotating outages. Though incremental procurement is in progress or soon to be authorized, not all of the new resources can address the critical grid needs later in the evening.

Extending the compliance date for Redondo Beach would be responsive to supporting system-wide grid reliability concerns in summer 2022 and 2023 due to extreme and prolonged climate-change induced weather conditions and would ensure that the electrical power needs essential for the welfare of the citizens of the State of California are met. Furthermore, the extension would also provide a necessary "bridge" as new procurement comes online, some of which will specifically address critical grid needs during the net demand peak period.

Alternative 2 – Extend OTC Compliance Date for Redondo Beach for One Year

In this alternative, SACCWIS would recommend the State Water Board extend the OTC Policy compliance date for Redondo Beach Units 5, 6, and 8 for one year, until December 31, 2022.

This alternative would help meet system reliability needs for September 2022 at HE 8 p.m. PDT. The need for an extension of Redondo Beach is demonstrated by the stack analysis, which shows shortfalls of 1,430 MW under a 15 percent PRM and 2,563 MW under a 17.5 percent PRM, with the only resources online in 2022 being those that currently exist (not including Redondo Beach) and those expected to come online by 2022. Assuming 1,500 MW of additional expedited procurement comes online on schedule, the power generated by Redondo Beach would help offset a remaining shortfall of 1,063 MW, based on a 17.5 percent PRM.

Even with an extension of the Redondo Beach compliance date, California may experience black-outs or brown-outs during times when electrical demand is high and imports are unreliable due to similar high demands in other states or BAAs, such as during extreme and prolonged heat waves. However, this risk would be significantly decreased due to the availability of an additional 834 MW from Redondo Beach to help meet the high demand in 2022.

This alternative would not help meet system reliability needs in 2023 due to the high level of uncertainty around resource supply. If a need is subsequently identified for 2023, there may not be enough time to conduct regulatory processes to amend the OTC Policy and further extend the compliance date. Similarly, depending on when a need is identified, the resource owner may not be capable of keeping the plant in service for an additional year.

Alternative 3 – No Action

In this alternative, SACCWIS would recommend no change to the OTC Policy compliance date. Redondo Beach would stop using ocean water for once-through cooling on or before December 31, 2021. California may experience black-outs or brown-outs during times when electrical demand is high and imports are unreliable due to similar high demands in other states or BAAs.

VIII. Regulatory Requirements

The following section describes water quality and air quality regulatory requirements and procedures related to a compliance date extension for Redondo Beach. These actions are separate and distinct from the contracting process for the power plant. If the State Water Board approves an OTC Policy compliance date extension, contracting for the power plant would occur separately and through other processes. The procurement process will identify the specific capacity needed to meet reliability requirements.

Water Quality

Following the SACCWIS' recommendation to extend the compliance date for Redondo Beach, the State Water Board would consider adopting an amendment to the OTC Policy to extend the compliance date. The most likely process will be for the State Water Board to consider the amendment in fall 2021 with sufficient time for the California Office of Administrative Law to review the amendment prior to December 31, 2021.

An alternative suspension process involves the CAISO sending letters to SACCWIS, the State Water Board, and the Los Angeles Regional Water Board notifying them that continued operation of Redondo Beach is deemed necessary to maintain grid reliability beyond December 31, 2021, and requesting suspension of Redondo Beach's compliance date for more than 90 days per Section 2.B.(2)(b) of the OTC Policy. Executive directors of the CEC and CPUC have ten days to submit letters stating any opposition to the suspension. If there is no opposition from the other energy agencies, the State Water Board shall conduct a hearing during the 90-day suspension or within 90 days of receiving the notification to determine whether to suspend the compliance date for more than 90 days. Per the OTC Policy, the State Water Board will afford significant weight to the recommendations of the CAISO. If suspended, the State Water Board would need to amend the OTC Policy on or before the end of the suspension period granted by the State Water Board.

Additionally, the NPDES permit and associated TSO issued to Redondo Beach by the Los Angeles Regional Water Quality Control Board (Los Angeles Regional Water Board) will expire on September 30, 2021, and December 31, 2021, respectively. Upon

submission of a complete Report of Waste Discharge, the NPDES permit may be administratively extended until the adoption of a new order; however, no additional time could be given to Redondo Beach to comply with certain final effluent limitations in this NPDES permit unless a revised TSO is adopted by the Los Angeles Regional Water Board. The Los Angeles Regional Water Board can develop a revised TSO for Redondo Beach concurrently with the OTC Policy amendment.

Air Quality

Stationary source permitting in California is the shared responsibility of CARB, the State's 35 local air pollution control agencies (air districts or districts), and U.S. EPA Region 9. CARB does not issue any preconstruction or operating permits for stationary sources, but plays an oversight role over district permitting programs. In California, a new or modified stationary source that will emit air pollutants typically must meet certain emission control requirements and obtain preconstruction and operating permits from the district where the source is located. The district prepares an engineering analysis and places conditions in the preconstruction permits to ensure compliance with the requirements of federal, State, and local air pollution regulations. Once construction is complete and compliance with preconstruction permit conditions is verified, an operating permit is issued. Title V is a federal Clean Air Act program, implemented by the states, designed to standardize operating permits and the permitting process for major sources of emissions.

Redondo Beach is located in the jurisdiction of the South Coast Air Quality Management District (SCAQMD) and has a valid Title V permit (expires on February 4, 2024). Generating Units 5, 6, and 8 can continue operating as long as the facility maintains compliance with its permit and any future applicable federal, state, and local air regulatory requirements.

IX. Conclusions

The SACCWIS recommends that the State Water Board extend the OTC Policy compliance date for Redondo Beach Units 5, 6, and 8 for two years through December 31, 2023, to help offset system-wide grid shortfalls projected during periods of high energy demand during the net demand peak period. Demand is projected to be highest

in September 2022 and 2023 during the 8:00 p.m. hour, with highest needs during extreme and prolonged west coast-wide heat waves induced by climate change. Extending the compliance date for Redondo Beach would be responsive to supporting system-wide grid reliability concerns in summer 2022 and 2023 and would ensure that the electrical power needs essential for the welfare of the residents of the State of California are met.

APPENDIX A

AVERAGE ANNUAL FLOW RATE DATA FOR ONCE-THROUGH COOLING FACILITIES

	Average Annual Flow Rate (MGD)								
Power Plant Name	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Humboldt Bay Power Plant Units 1&2	0	0	0	0	0	0	0	0	0
Potrero Power Plant	152	0	0	0	0	0	0	0	0
Contra Costa Generating Station	15.4	33	53	17	0	0	0	0	0
Pittsburg Power Plant	18.8	16.9	79	48.8	26	67	32	0.07	0
Moss Landing Power Plant	289.9	212.3	396.4	353.6	244.9	312.5	231	135.2	200.3
Diablo Canyon Nuclear Power Plant	2,347	2,368	2,277	2,311	2,242	2,360	2,372	2,286.4	2,338
Morro Bay Power Plant	21.5	41.7	50.2	22.7	0.2	0	0	0	0
El Segundo Generating Station	112.9	97	197	217	107	135	7	4.58	0
Haynes Generating Station Units 1&2	720	812	886	725	471	506	448	355.5	441
Scattergood Generating Station	276.4	299	296.8	272	244	311	151	109.8	108
Harbor Generating Station	45.5	44.0	47.3	46.8	49.6	49.1	47	50.07	46
Alamitos Generating Station	2.9	106	375	496	332	324	317	316.21	114.74*
Redondo Beach Generating Station	59	180	178	95	107	142	95	156.95	75.3*
Mandalay Generating Station	39.7	56	77	109	63	78	56	48.4	3
Ormond Beach Generating Station	12	18	71	133	68	98	60	86.6	117.9
Huntington Beach Generating Station	202.9	242.6	238.5	178	169	159.6	134	134.2	114.5
South Bay Power Plant	34.5	0	0	0	0	0	0	0	0

	Average Annual Flow Rate (MGD)								
Power Plant Name	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Encina Power Plant	211.9	314.5	531.1	264.0	338.6	410.2	325	387.8	356.1
San Onofre Nuclear Generating Station	2,030	2,256	1,677	1,003	42	42	37	0	0
Total	**6,592.3**	**7,097**	**7,430.3**	**6,291.9**	**4,504.3**	**4,994.4**	**4,312**	**4,071.8**	**3,915.9**

Source: EPA Flow Data, (Intergraded Compliance Information System [ICIS] Database) Julie Johnson and Jonathan Dolan. Updated on February 16, 2021.

*Previous 2018 values for Alamitos and Redondo Beach Generating Stations were not calculated properly. These values have been updated and are now displayed correctly.

AVERAGE ANNUAL FLOW RATE DATA FOR ONCE-THROUGH COOLING FACILIITES (CONTINUED)

	Average Annual Flow Rate (MGD)	
Power Plant Name	**2019**	**2020**
Humboldt Bay Power Plant Units 1&2	0	0
Potrero Power Plant	0	0
Contra Costa Generating Station	0	0
Pittsburg Power Plant	0	0
Moss Landing Power Plant	236.2	241.2
Diablo Canyon Nuclear Power Plant	2,067	2,282
Morro Bay Power Plant	0	0
El Segundo Generating Station	0	0
Haynes Generating Station Units 1&2	398.7	467.0
Scattergood Generating Station	98.1	124.0
Harbor Generating Station	48.1	45.0
Alamitos Generating Station	101.8	126.7
Redondo Beach Generating Station	72.4	80.2
Mandalay Generating Station	0	0
Ormond Beach Generating Station	146.9	227.5
Huntington Beach Generating Station	113.4	82.1
South Bay Power Plant	0	0

	Average Annual Flow Rate (MGD)	
Power Plant Name	**2019**	**2020**
Encina Power Plant	262.1	0
San Onofre Nuclear Generating Station	0	0
Total	**3,545**	**3,814**

Source: EPA Flow Data, (Intergraded Compliance Information System [ICIS] Database) Jonathan Dolan. Updated on February 16, 2021.

APPENDIX B

INPUTS, ASSUMPTIONS, AND METHODOLOGY FOR RESOURCE STACK ANALYSIS

The table below summarizes the input assumptions for Tables 9 through 12 and Figure 8 for June through October 2022.

Resource supply stack	

PRM	Current PRM – 15 percent. *See CPUC's website for details.*
	
	CAISO proposed PRM - 17.5 percent comprised of:
	
	• 6 percent for operating reserves
	  ○ Glossary of Terms Used in the North American Electric Reliability Corporation's Reliability Standards
	  ○ North American Electric Reliability Corporation Contingency Reserve
	• 4 percent for load above 1-in-2 system demand
	  ○ Reflects the approximate difference between a 1-in-2 and 1-in-5 peak forecast. For example, the CAISO footprint coincident peak for 2022 is 45,448 MW for the 1-in-2 forecast. The 1-in-5 forecast from the same data set is 47,383 MW, or 4.3 percent higher. An increase from the 1-in-2 to the 1-in-10 forecast reflects a 6.6 percent increase in the peak demand.
	  ○ Load Serving Entity and Balancing Authority Tables
	• 7.5 percent for forced outages
	  ○ Based on the weighted equivalent forced outage rate from the North American Electric Reliability Corporation Generator Availability Data System.

Load	• CEC 2020 2020 IEPR 1-in-2 system peak Mid-Mid Load. • Used 2022 forecast for HE 8 p.m. PDT which is HE19 Pacific Standard Time (HE19 PST) in 2020 IEPR data. IEPR dataset is entirely in PST, which does not consider daylight saving.

Existing generation	
NQC	Final NQC Report for Compliance Year 2021 (Version dated November 13, 2020.) Resource IDs from the NQC list were cross-referenced with CAISO Master Control Area Generating Capability List for resource category verification. The Master Control Area Generating Capability List is available on CAISO's website.
Gas Generation	
Existing gas generation	Existing generators from 2021 NQC list based on values for each month of analysis. Includes OTC units: Alamitos Units 3, 4, and 5; Huntington Beach Unit 2; and Ormond Beach Units 1 and 2. Includes RMR generators: Oakland Unit 2 and 3, Channel Island Power, Greenleaf II Cogen. Note: Midway Sunset Cogeneration was included on the 2021 NQC list. Includes announced retirements. Does not include new units. Dynamic scheduled generators included in Imports.
Nuclear	
Existing nuclear	Diablo Canyon Unit 1 and 2. Qualifying capacity based on 2021 NQC list based on monthly values. Dynamic scheduled generators included in Imports.
Existing hydro (including Pumped Storage)	
Large Hydro	>30 MW hydro resources within the CAISO footprint. Qualifying capacity based on 2021 NQC list based on monthly values. Dynamic scheduled generators included in Imports.
Small Hydro	≤30MW, renewable portfolio standard eligible resources within the CAISO footprint. Qualifying capacity based on 2021 NQC list based on monthly values.
Pumps with NQC	Pumps designated to provide ancillary services with an NQC value. Qualifying capacity based on 2021 NQC list based on monthly values.
Pumped Storage	Includes: Eastwood; Helms Units 1, 2, and 3; Lake Hodges Unit 1 and 2; and San Luis.

Existing battery	
Existing batteries	Total installed values from 2021 NQC list based on monthly values.
Existing renewables and other resources	
Existing wind	Total installed values from 2021 NQC list based on monthly values. Qualifying capacity based on effective load carrying capability for each month from D.19-06-026.
Existing other renewables	Includes Biomass, Biogas, Geothermal, Heat Recovery, and Waste to Power. Qualifying capacity based on 2021 NQC list based on monthly values.
Existing other resources	Includes coal and miscellaneous resources. Qualifying capacity based on 2021 NQC list based on monthly values.
Demand Response	
Adjusted demand response	Demand response assumed to be the sum of two sources (1) IOU programs registered in the CAISO market plus (2) third-party demand response programs in the CPUC-jurisdictional footprint typically shown as resource adequacy. Demand response from IOU programs: Individual IOU demand response totals spreadsheets for Pacific Gas & Electric, SCE, and SDG&E. Based on the monthly values from June through October for 2022 Total Event-Based/Supply-Side Programs (inclusive of transmission and distribution loss factor gross up). Monthly totals are further grossed up for 15 percent PRM per current practice. Demand response from third-party providers: Assumed 250 MW per month, equivalent to the current monthly shown resource adequacy levels of demand response. Adjusted Demand Response assumes a 60 percent success response rate of the total Demand Response for each month based on summer 2020 performance of 50 percent with a slight improvement expected by summer 2022. See also *Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave*, January 13, 2021, "Table 4.3: Comparison of Demand Response Performance During August Stage 3 Events," p. 56.
Incremental resources net of stand-alone solar	

Incremental resources net of stand-alone solar	Incremental resources are new resources expected to be online by August 2022 (both contracted and uncontracted). Source: *Status of New Resources Expected*, November 2020, CPUC Energy Division, page 7. Reporting method: Analysis only reports online dates by August 1 of each year. Therefore, data for June and July 2022 reflect values for all new resources expected online by August 1, 2021. August through October 2022 reflect values for all new resources expected online by August 1, 2022. Stand-alone solar NQC values are subtracted from the incremental resource values by month, using the same reporting method above.
Imports (based on total maximum import capability of 10,805 MW)	
Contracted resource adequacy imports	Based on average of historical contracted imports from 2015 through 2020 for each month, which includes both drought and non-drought years. Includes Palo Verde and Hoover and dynamically scheduled resources. Average values are: ○ June: 3,922 MW ○ July: 5,340 MW ○ August: 6,095 MW ○ September: 5,921 MW ○ October: 4,171 MW
Estimated CPUC expedited procurement	
Estimated CPUC expedited procurement	1,500 MW per month based on CPUC staff estimates of expedited procurement through the CPUC's *Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Reliable Electric Service in California in the Event of an Extreme Weather Event in 2021* (R.20-11-003).
Redondo Beach Generating Station	
Redondo Beach Generating Station	Redondo Generating Station Unit 5, 6, and 8. Qualifying capacity based on 2021 NQC list based on monthly values.

Enclosure 2

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2021-0048

AMENDMENT TO THE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING TO REVISE THE COMPLIANCE SCHEDULE FOR REDONDO BEACH GENERATING STATION

WHEREAS:

1. The State Water Resources Control Board ("State Water Board") is designated as the state water pollution control agency for all purposes stated in the Clean Water Act, including water quality control planning and waste discharge regulation.

2. The State Water Board is responsible for adopting state policy for water quality control, which may consist of water quality principles, guidelines, and objectives deemed essential for water quality control.

3. On May 4, 2010, the State Water Board adopted the statewide "Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling" ("Once-Through Cooling" or "OTC Policy") under Resolution No. 2010-0020. The Office of Administrative Law approved the OTC Policy on September 27, 2010, and the OTC Policy became effective on October 1, 2010. The OTC Policy was amended in 2011, 2013, 2015, 2017, and 2020.

4. The OTC Policy establishes uniform, technology-based standards to implement Clean Water Act section 316(b), which requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts.

5. The OTC Policy applies to nine existing power plants located along the California coast, and is implemented through National Pollutant Discharge Elimination System ("NPDES") permits, issued pursuant to Clean Water Act section 402, which authorize the point source discharge of pollutants to navigable waters. The OTC Policy originally affected nineteen once-through cooling power plants, and ten of those facilities have ceased all once-through cooling operations since adoption of the OTC Policy.

6. The OTC Policy establishes a schedule that provides the latest compliance date for the replacement, repowering, or retirement of each remaining power plant still utilizing once-through cooling operations while accounting for potential impacts to California's electrical supply.

7. Section 3.A of the OTC Policy requires the owner or operator of an affected fossil-fuel power plant to submit an implementation plan to the State Water Board by April 1, 2011, selecting one of two OTC Policy compliance tracks and describing the general design, construction, or operational measures to implement the compliance track. The State Water Board received implementation plans from all owners and/or operators as requested, including the implementation plan for AES-Southland, Inc. ("AES") Redondo Beach. AES plans to comply with the OTC Policy through ceasing once-through cooling operations at Redondo Beach by its compliance date.

8. The Statewide Advisory Committee on Cooling Water Intake Structures ("SACCWIS") is composed of representatives from the California Air Resources Board, the California Coastal Commission, the California Public Utilities Commission ("CPUC"), the California Energy Commission ("CEC"), the California State Lands Commission, the California Independent System Operator ("CAISO"), and the State Water Board. The purpose of the committee is to review implementation plans and schedules and to advise the State Water Board on OTC Policy implementation, in order to ensure that the implementation schedule takes into account local area and grid reliability, including permitting constraints.

Redondo Beach Generating Station

9. On September 1, 2020, the State Water Board adopted Resolution No. 2020-0029, in part amending the OTC Policy to extend the compliance date for Redondo Beach Generating Station ("Redondo Beach") Units 5, 6, and 8 from December 1, 2020, through December 1, 2021, to support local and system-wide grid reliability.

10. Large portions of the western United States experienced extreme and prolonged heat conditions from August 14 through 19, 2020, impacting the demand for and supply of electric generation. Generation resources were constrained, and imports of electricity were significantly reduced. As a result, the CAISO declared Stage 3 Emergencies on August 14 and 15, 2020, resulting in rotating but controlled blackouts of California (collectively, the August 2020 blackouts).

11. As a result of the August 2020 blackouts, the State Water Board recognized in Resolution No. 2020-0029 that the CPUC, CEC, and CAISO may revise their forecasting models to account for unexpectedly high peak energy demands during widespread extreme high temperatures, and may determine a need to request additional extensions of compliance dates to maintain grid reliability and to avoid similar blackouts in the future.

12. The CPUC opened Rulemaking (R.)20-11-003 on November 20, 2020, to consider a suite of actions within its authority to address potential grid reliability issues starting in summer 2021. Additionally, Governor Gavin Newsom ordered the CPUC, CEC, and CAISO to investigate and report on the root causes of the events leading to the August 2020 blackouts.

13. On January 13, 2021, the CPUC, CEC, and CAISO released the Final Root Cause Analysis Report. These causes of the August 2020 blackouts were primarily related to climate change-induced extreme weather conditions, availability of energy supply, and adequacy of market practices to meet associated energy demands.

14. As a part of CPUC R.20-11-003, the CPUC adopted Decision (D.)21-02-028 on February 11, 2021, directing the state's three largest investor-owned utilities to seek contracts for energy capacity that will be available for the net peak demand in the summer of 2021. Building on R.20-11-003, the CPUC adopted D.21-03-056 on March 25, 2021, to direct the state's three largest investor-owned utilities to take actions to decrease peak and net peak demand and increase peak and net peak supply in the summers of 2021 and 2022.

15. The CPUC in D.21-03-056 also increased the Planning Reserve Margin from 15 percent to 17.5 percent on a temporary basis in the summers of 2021 and 2022, applicable to the state's three largest investor owned utilities. This change increased the reserve for electricity capacity supply side resources during moments when the grid is experiencing stress. The CPUC modified D.21-03-056 on June 25, 2021, to clarify several programmatic elements that affected entities to which the Decision applied.

16. The CPUC, CEC, and CAISO conducted a comprehensive system-wide analysis, or stack analysis, to compare forecasted demand to the capacity of all existing resources and resources expected to be online in 2022. This stack analysis reflected conditions present during the August 2020 blackouts, and demonstrated that energy supply is insufficient to meet projected demand in 2022. The stack analysis incorporated a 17.5 percent Planning Reserve Margin. The stack analysis projected a 414 MW shortfall would occur during July and a 2,563 MW shortfall would occur during September 2022. With expedited procurement from CPUC, this shortfall was negated in July and reduced to 1,063 MW in September. The CPUC, CEC, and CAISO also identified a band of uncertainty that could impact grid reliability in the summer of 2023, as well as a potential 500 MW increase in net peak demand in 2023. Redondo Beach's Net Qualifying Capacity would provide approximately 834 MW to alleviate the projected shortfall in 2022 and the band of uncertainty in 2023.

17. On March 26, 2021, the SACCWIS met and approved the *Final 2021 Report of the SACCWIS*. This report assessed electric system reliability. The SACCWIS recommended the State Water Board consider extending the compliance date of Redondo Beach Units 5, 6, and 8 for two years through December 31, 2023, to help alleviate projected system-wide shortfalls during periods of high peak and net peak demand.

18. The Amendment to the Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling to Extend the Compliance Schedule for the Redondo Beach Generating Station ("Amendment") extends the compliance date for Redondo Beach Units 5, 6, and 8 by two years from December 31, 2021, to December 31, 2023, as recommended by the SACCWIS. The amendment revises the implementation schedule for Milestone 30 of Table 1 in Section 3.E of the OTC Policy. The Amendment to the Water Quality Control Plan on the Use of Coastal and Estuarine Waters for Power Plant Cooling for Extension of the Compliance Schedule for the Redondo Beach Generating Station Staff Report ("Staff Report") includes the rationale and considerations for the extension, an addendum to the 2010 Final Substitute Environmental Documentation, and additional information to support the Amendment.

19. The State Water Board adopted the OTC Policy with the explicit purpose of minimizing adverse environmental impacts to marine life resulting from use of coastal and estuarine waters for power plant cooling, and the State Water Board remains committed to timely compliance with the OTC Policy by owners and operators of affected power plants. Further, the State Water Board recognizes that OTC Policy compliance dates provide certainty to communities in planning for future land use.

    In adopting the OTC Policy, the State Water Board recognized that power generating facilities are part of a state-wide electrical grid and that changes in generating capacity resulting from OTC Policy compliance may have an impact on the grid and power availability, requiring long-term planning for transmission, generation, and demand resources. The OTC Policy provided a lengthy compliance schedule based upon extensive consultation with the energy agencies in order to facilitate planning for potential replacement, repowering, or retirement of affected power plants while avoiding disruption in the state's electrical supply. The OTC Policy requires compliance as soon as possible, but no later than the dates set forth in the Policy Implementation Schedule (Policy Section 2.B.(1)), providing for State Water Board consideration of suspensions or revisions of compliance dates recommended by the energy agencies "[b]ased upon the need for continued operation of an existing power plant to maintain the reliability of the electrical system . . . ." (OTC Policy section 2.B.(2), Policy Section 3.B.) Provisions for NPDES permits implementing the OTC Policy further emphasize that compliance schedule revisions recommended by the SACCWIS are those "necessary to maintain reliability of the electric system." (OTC Policy section 3.C.(1).) The OTC Policy also directs that, where the energy agencies make a unanimous recommendation for compliance date revisions based on grid reliability, the State Water Board "shall afford significant weight to the recommendation." (OTC Policy section 3.B(5).)

20. The CPUC, CEC, and CAISO unanimously voted in favor of recommending the extension to Redondo Beach's compliance date at the March 26, 2021 meeting of the SACCWIS.

21. On August 11, 2021, the CEC released its Preliminary 2022 Summer Supply Stack Analysis, which is intended to better inform the public about potential implications should the ongoing drought and extreme heat events persist into summer 2022. The CEC adopted a final revised version of this stack analysis on September 8, 2021. This stack analysis accounted for both average and extreme weather planning reserve margins. Results confirmed that additional capacity is needed in September 2022 under the average scenario planning reserve margin, before counting Redondo Beach's net qualifying capacity. Under the extreme weather planning reserve margin, potential energy shortfalls range from approximately 200 MW to 4,350 MW, before counting Redondo Beach's net qualifying capacity. Either planning reserve margin scenario results in projected shortfalls that further indicate Redondo Beach's capacity is needed to partially offset the shortfalls during periods of high net peak demand.

22. The CPUC, CEC, and CAISO may further revise their forecasting models or projections to account for stressors on the grid posed by climate change or other factors that may impact availability of peak or net peak supply and peak or net peak demand, and may determine that there is a need to request additional extensions of final compliance dates to maintain grid reliability. However, on June 30, 2021, the CPUC in D.21-06-035 did not recommend any additional extensions of OTC Policy compliance dates beyond the extension for Redondo Beach through 2023.

23. The State Water Board's primary responsibility and jurisdiction is to implement CWA 316(b) and ensure that the beneficial uses of the state's coastal and estuarine waters are protected. The compliance schedule revision for Redondo Beach is adopted in order to provide for grid reliability needed in the short term and should not be interpreted in any way as the State Water Board retreating from its goal of phasing out adverse environmental impacts resulting from use of coastal and estuarine waters for once-through cooling.

California Environmental Quality Act

24. The California Natural Resources Agency approved the State Water Board's water quality control planning process, which includes state policies for water quality control, as a certified regulatory program that adequately satisfies the California Environmental Quality Act (CEQA) requirements for preparing environmental documents (California Code of Regulations, title 23, section 3777). A substitute environmental document (SED) is used in place of an environmental impact report as CEQA environmental documentation.

25. The Staff Report contains the required environmental documentation under the State Water Board's CEQA regulations. The change in compliance date does not constitute a project within the meaning of CEQA. Nonetheless, the Staff Report includes an addendum to the Final SED, which was adopted with the OTC Policy on May 4, 2010. The addendum concludes that extending the compliance date does not lead to new significant environmental impacts or a substantial increase in the severity of previously identified environmental effects.

26. Consistent with CEQA, the State Water Board finds the Staff Report does not engage in speculation, but rather analyzes the project and the alternatives to the project, and concludes that the project will not result in any additional environmental impacts. This finding reflects the State Water Board's independent judgment.

Offsetting Impacts

27. AES, or future owners and operators of Redondo Beach, will be required to continue implementing measures to mitigate interim marine life impingement and entrainment impacts up to and until final compliance with the OTC Policy, in accordance with requirements set forth in OTC Policy Section 2.C.(3).

28. In a letter dated June 9, 2021, AES indicated its commitment to a voluntary environmental benefits package to enhance coastal resources in the areas affected by the power generating station in the event that the State Water Board approves the two-year compliance date extension for Redondo Beach. AES expressed its intent to provide 1.5 million dollars in grant funds for enhancement of regional wetlands projects, education and outreach in nearby disadvantaged communities and enhancement of marine facilities during the two-year period comprising the extension. Potential recipients of these grant funds include: Los Cerritos Wetlands Authority ($1,000,000) for wetlands restoration projects within Los Cerritos Wetlands; Tree People ($250,000) for expansion of existing programs to provide education and outreach in areas determined to be disadvantaged in South and South Central Los Angeles County; and Bolsa Chica Conservancy ($250,000) for facility upgrades, educational programs and other activities associated with the Bolsa Chica Wetlands Project.

    The voluntary payments proposed by AES are unrelated to any requirement or obligation imposed pursuant to CEQA, either by the State Water Board or Regional Water Quality Control Boards or any other public agency. The payments are also unrelated to ongoing interim mitigation requirements imposed by OTC Policy Section 2.C.(3), which are requirements that continue to apply in full until Policy compliance is achieved.

    While the State Water Board finds that AES' proposed expenditures would provide value to existing coastal restoration projects and community outreach efforts, the voluntary benefits described do not affect this Board's conclusions about approving the compliance date extension. Approval of the proposed OTC Policy amendment is entirely independent of any benefit that may accrue from the voluntary environmental programs that AES agrees to fund. Nonetheless, the Board recognizes the value in AES' proposed expenditures to benefit coastal resources and expects AES to fulfill the commitments described.

Public Process

29. The State Water Board provided a written public comment period from June 14, 2021, through noon on July 16, 2021, consistent with state and federal public participation requirements.

30. The State Water Board carefully considered comments received and responded to comments. Based on the comments, the State Water Board revised the Staff Report. The responses to comments and revisions to the Staff Report do not add significant new information that is material to the State Water Board's decision or that would otherwise warrant action that is not a logical outgrowth of the proposed Amendment that was previously subject to a written comment period. Therefore, it is not necessary to afford interested persons with an additional written comment period to address the responses to comments or revisions to the Staff Report.

31. The State Water Board conducted a public hearing on October 19, 2021, to solicit comments regarding the proposed amendment to the OTC Policy and has reviewed and carefully considered all comments and testimony received.

Effective Date

32. The Amendment to the OTC Policy will become effective upon approval by the Office of Administrative Law.

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. Approves and adopts the Staff Report and Addendum to the 2010 Final SED and directs the Executive Director or designee to transmit the Notice of Decision to the Secretary of Resources.

2. Adopts the Amendment to the OTC Policy to extend the compliance date for Redondo Beach Generating Station Units 5, 6, and 8 by two years from December 31, 2021, to December 31, 2023.

3. Authorizes the Executive Director or designee to submit the amendment to the Office of Administrative Law for review and approval.

4. If, during the approval process, State Water Board staff or the Office of Administrative Law determines that minor, non-substantive modifications to the language of the Amendment are needed for clarity or consistency, the Executive Director or designee may make such changes and shall inform the State Water Board of any such changes.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 19, 2021.

AYE:	Chair E. Joaquin Esquivel Vice Chair Dorene D'Adamo Board Member Sean Maguire Board Member Laurel Firestone Board Member Nichole Morgan
NAY:	None
ABSENT:	None
ABSTAIN:	None

Jeanine Townsend
Clerk to the Board

Enclosure 3

DOCKETED	
Docket Number:	21-ESR-01
Project Title:	Energy System Reliability
TN #:	239635
Document Title:	Staff Paper - Revised 2022 Summer Supply Stack Analysis
Description:	N/A
Filer:	Courtney Wagner
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	9/8/2021 1:51:22 PM
Docketed Date:	9/8/2021

California Energy Commission

STAFF PAPER

2022 Summer Stack Analysis

Angela Tanghetti, Liz Gill and Lana Wong
Supply Analysis Office
Energy Assessments Division

September 2021| CEC-200-2021-006

DISCLAIMER

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ABSTRACT

The Summer 2022 Stack Analysis Report (Stack Analysis) provides near-term situational awareness in the event of westwide extreme weather and prolonged drought. The report provides a point of reference for consideration in other energy reliability-related proceedings. The report uses the CEC's Stack Analysis Tool to identify potential amounts and duration of the need for near term contingency resources. Staff will update the Stack Analysis Tool if underlying assumptions change, such as drought conditions or data on available resources.

Keywords: Stack analysis, system reliability, short-term reliability, summer 2022, supply resources, extreme weather, electricity system planning

Please use the following citation for this report:

Tanghetti, Angela, Liz Gill, and Lana Wong. 2021. *2022 Summer Stack Analysis*. California Energy Commission. Publication Number: CEC-200-2021-006.

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EXECUTIVE SUMMARY

Extreme heat events in 2020 impacted the western United States and strained electric system operations reliability in California. With climate change, extreme weather events that were previously considered low-probability events must be accounted for in near-term electric sector planning.

The California Energy Commission (CEC) developed the hourly stack analysis to assess supply conditions against average and extreme weather conditions for summer 2022. The hourly stack analysis supplements traditional planning methods and is intended to provide a snapshot of an extreme weather event and potential need to prepare for contingencies.

The Summer 2022 Stack Analysis identifies the risk of potential energy shortfalls under average and extreme weather planning reserve margins. This analysis projects potential need for contingencies resources during a few hours that could range in amount of 200 megawatts (MW) to 4,350 MW. These resources may be required to ensure electric system reliability for peak and net-peak hours during summer 2022 under extreme weather events.

Background

Extreme heat events, or heat waves, in 2020 impacted the western United States and strained electric system operations in California, resulting in rolling outages on August 14 and 15, 2020. The Final Root Cause Analysis (RCA) — prepared for Governor Gavin Newsom by the CEC, California Public Utilities Commission (CPUC), and California Independent System Operator (California ISO) and published January 13, 2021 — detailed three root causes behind the outages and identified actions to be taken by the three entities to reduce the potential for grid outages, like those that occurred in August 2020. The RCA required the CEC to develop and publish a multiyear statewide summer assessment to provide information to support reliability planning and maintain situational awareness of potential impacts to grid reliability under extreme conditions.

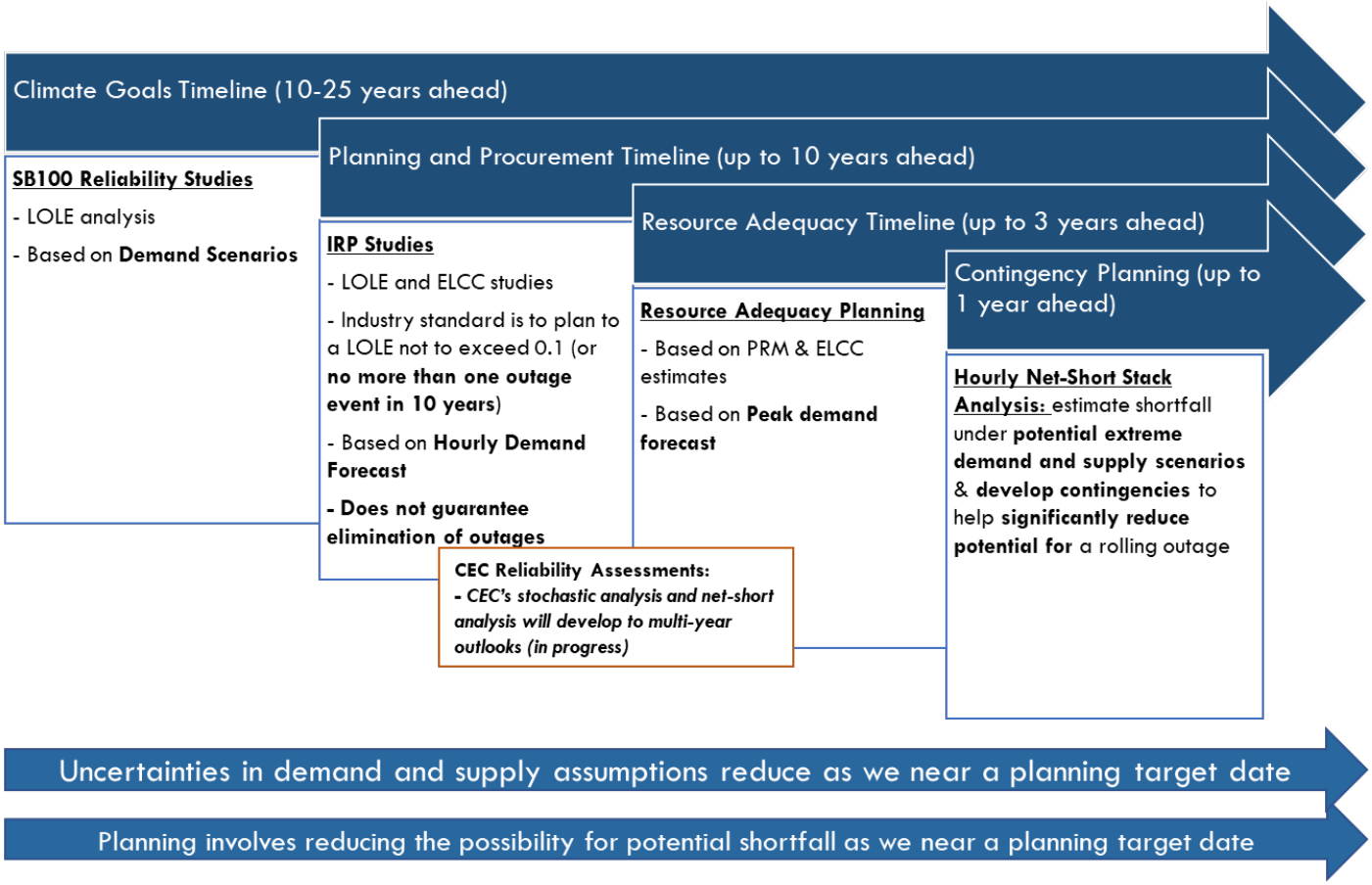
In response, the CEC began development of two reliability assessment products: 1) hourly Stack Analyses to help support contingency planning and 2) stochastic loss-of-load-expectation (LOLE) analyses to help support long-term policy studies and midterm procurement planning. The hourly Stack Analysis assesses supply conditions against average and extreme weather conditions as individual scenarios using different levels of planning reserve margins to capture demand and supply conditions. The hourly Stack Analysis supplements traditional planning methods and is intended only to provide a snapshot of a potential worst-case scenario on the California ISO system to inform the need to prepare for adequate contingencies. As such, the extreme scenario is developed to capture extreme conditions. While portions of an identified shortfall in an extreme weather scenario might be deemed necessary to be addressed by additional procurement, the intention of an hourly Stack Analysis is not to determine whether traditional procurement is needed. Traditional planning tools, such as the LOLE analysis in combination with hourly Stack Analyses, can provide a more robust picture to determine the balance between traditional procurement and contingency resources.

In this document, the CEC's preliminary outlook of summer 2022 under extreme supply-and-demand conditions helps inform potential shortfalls and develop contingencies. The CEC will continue to update the 2022 hourly Stack Analysis over the coming months as new information becomes available. A separate LOLE analysis that was developed for 2022 is expected to be published at the end of September 2021.

Reliability Analysis Across Planning Horizons

While reliability analysis has always been a core component of electric sector planning, the challenges on the electric grid in recent years brings into focus the need to maintain a complete picture of reliability risks across all time horizons. However, the specific purpose, type of analysis, and detail change as planners approach the target year. The more near-term the analysis, the less uncertainty there is in supply and demand and the greater the focus is on reducing the probability of realized supply shortfalls.

Figure 1: Reliability Analysis Across Planning Horizons



Source: California Energy Commission

Long-term studies, such as those to meet California's 2045 Senate Bill 100 (De León, Chapter 312, Statutes of 2018) goals, are focused on developing directional portfolios to meet long-term climate goals. There is significant uncertainty in demand and potential supply, so the goal of reliability studies is to determine whether the magnitude and type of resources in the portfolio are reasonable to maintain reliability.

In the planning studies, which typically have a 10-year planning horizon, portfolios are developed to provide guidance to procurements and to inform critical planning processes. The goals of reliability studies are to determine the resources needed to avoid a significant risk of supply shortfalls while balancing the cost of absolute reliability. Reliability is typically assessed through an LOLE analysis, a stochastic analysis incorporating a distribution of demand profiles, wind and solar profiles, and randomized forced outages to determine a probability of a supply shortfall. The typical standard is for the analysis to predict a loss-of-load event no more than once every 10 years.

A portfolio meeting the LOLE standard by itself does not eliminate the probability of realized outages for several reasons. First, by definition, the one-in-10-year standard does not eliminate the probability of outages. Second, the actualized probability of outages may be different than the model suggests if the inputs do not reflect conditions in the given year. For example, if the model assumes an average hydroelectric (hydro) year across all years, but in reality, there are drought conditions, the probability of a loss of load event may be higher. Another example is if the distribution of

demand profiles is wider, or more extreme, due to climate change but is not captured in the dataset that relies on historical data, the probability of a loss of load event may also be higher.

In the contingency planning time frame, a year to days ahead, the reliability analysis develops a situational awareness of available supply and demand to prepare contingency resources should conditions be tight. With changing resource supply conditions in California and the West and with increasingly extreme weather conditions due to climate change, this time frame has come into greater focus. In response to the 2020 rotating outages, the CEC has developed an hourly Stack Analysis to evaluate whether there are potential shortfalls that could occur should another extreme heat event occur, particularly as the state is experiencing drought and wildfires.

Summer 2022 Hourly Stack Analysis

As a result of the 2020 heat waves, the CEC initiated an annual reliability outlook in early 2021, which assesses anticipated supply against anticipated demand under average and extreme weather conditions. This outlook is an hourly stack of available supply given projected hourly demand for the peak day of each month, July 2021 through September 2021. The first summer 2021 Stack Analysis was presented at a May 4, 2021, joint agency Integrated Energy Policy Report (IEPR) workshop. This analysis included projections for August 2021 and September 2021 with the current information on CPUC expedited procurement and an average projection for resource adequacy imports considering average and extreme weather scenarios. The analysis showed the potential need to call on contingency resources of up to 2,300 MW during the 6 p.m. to 8 p.m. period under extreme weather. Contingency resources include voluntary and compensated customer load reductions, electricity imports from other balancing authorities, and additional thermal generation.

Shortly after the May 4, 2021, IEPR workshop, it became apparent that an update of the analysis was necessary. Significant impacts to hydro supply and demand were identified due to the 2021 drought, CPUC staff identified procurement delays, and the Russell City Energy Center, a 600 MW electric generating facility Hayward (Alameda County), went offline due to a catastrophic incident with the steam turbine generator. CEC staff updated the Stack Analysis and presented the results at a July 8, 2021, joint agency IEPR workshop. The summer 2021 analysis showed a potential to call on contingency resources of up to 3,800 MW under an extreme weather scenario.

After the July 8, 2021 IEPR workshop, the CEC, CPUC, and California Independent System Operator (California ISO) agreed to develop a preliminary Summer 2022 Stack Analysis to better inform the public about potential implications if the 2021 California drought and western extreme heat events persist into summer 2022, as current National Oceanic and Atmospheric Administration models predict.[1]

The draft 2022 Summer Stack Analysis was presented at the CEC's August 11, 2021, Business Meeting for stakeholder review and comment. Pacific Gas and Electric, Southern California Edison, and Middle River Power provided comments. Furthermore, the CEC identified additional updates to data inputs.

The commenters questioned the value of developing a Stack Analysis as opposed to a stochastic analysis. The 2022 Summer Stack Analysis is intended to provide a snapshot of the potential impact on supply and demand if drought persists and extreme weather impacts California and the rest of the West in 2022. The CEC recently developed a preliminary midterm stochastic analysis (MTR) and presented it at a CEC Lead Commissioner Workshop on August 30, 2021.[2] The MTR provides another perspective on 2022 summer reliability. The 2022 Summer Stack Analysis is within the range of possible outcomes shown in the stochastic analysis.

1 https://www.cpc.ncep.noaa.gov/products/predictions/long_range/two_class.php

2 Lead Commissioner Workshop on Midterm Reliability Analysis and Incremental Efficiency Improvements to Natural Gas Power Plants (ca.gov)

The following section provides the input assumptions and the projected July 2022 through September 2022 Stack Analysis considering both an average (15 percent) and extreme weather (22.5 percent) demand curve.

Summer 2022 Key Input Assumptions and Common Theme Stakeholder Comments

Assumptions about demand and available resources in 2022 are based on the best available data at this time. Demand is based on the 2020 CEC IEPR Update Mid-Mid Demand Case.[3] Available supply projections are based on the California ISO NQC list for 2021, with modifications based on anticipated new resources, planned retirements, and potential drought impacts persisting in 2022. Supply assumptions are intended to reflect physical resource availability and may not necessarily reflect resource adequacy or other contracts. The assumptions used in the 2022 analysis are presented in Table 1 and Table 2.

Updates to the Draft Analysis Inputs and Assumptions

The following is a summary of the updates made to the analysis and a description of public comments and CEC responses:

- **Additional Demand Response (DR) and Liquidated Damage Firm Imports**: The draft analysis did not include publicly owned utility (POU) DR and liquidated damage firm import POU programs and contracts within the California ISO footprint. These additional resources are now accounted for and outlined in Table 2.
- **Resource Availability**: CPUC staff provided updates on procurement to date and projected resources to be available for summer 2022. These are outlined in Table 2.
- **Hydro Capacity**: Stakeholders considered the 1,500 MW hydro capacity derate for 2022 as conservative. This hydro capacity derate is supported by the recently released California ISO preliminary 2022 NQC list. These preliminary NQC values for hydro capacity are about 800 to 1,000 MW lower, depending on the month, compared to 2021 NQC hydro capacity. The preliminary 2022 hydro NQC capacity represents an average of 3 (2018–2020) or 10 (2011–2020) historical years of actual hydro[4] output, which may overestimate performance in a prolonged drought year, as observed in 2021. To better represent hydro capacity during a prolonged drought, a derate for 2022 of up to 1,500 MW is reasonable.
- **Hydro Net Qualifying Capacity (NQC) That May Already Include Forced Outages**: Stakeholders commented that the use of a 7.5 percent forced outage rate was overly conservative and the hydro NQC may already account for outages. The higher 7.5 percent forced outage rate projection for the 22.5 percent planning reserve margin represents the potential impact that an extreme weather event, fire, and smoke may add to outages in the supply fleet. It is correct that hydro NQC values may already account for some forced outages. The 15 percent PRM includes a lower, 5 percent forced outage projection that does not represent the impact of persisting drought conditions and extreme weather on the supply fleet.

3 https://efiling.energy.ca.gov/getdocument.aspx?tn=236297-6

4 https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/q/6442466773-qc-manual-2020.pdf. See page 18.

- **Holding DR and Storage Contributions Static**: Stakeholders questioned why the DR and battery storage hourly capacity contributions were static for longer than four hours. This is a simplification assumed in the tool; however, it was determined that removing all the DR and battery storage in hours with no trigger contingencies did not trigger additional hours with contingencies. For future versions of the Stack Analysis Tool, this assumption will be modified to limit DR and batteries to four hours of full output, as large increases to the battery storage resource category are proposed for future years.
- **Use of Technology Factors for Wind**: Stakeholders questioned the use of technology factors, as opposed to hourly wind profiles. Wind profiles on historical extreme weather event days show highly inconsistent generation profiles. Instead of using an average profile based on historical years, the technology factor was a more robust option. The CEC will endeavor to develop and include wind profiles corresponding to extreme heat events in future versions of the tool.
- **Import Availability**: Stakeholders commented on the challenges with quantifying imports. Several noted that not all resources in the California ISO are under contract and may become exporters into other balancing authority areas, thereby effectively decreasing the import projections. Others commented that the import assumption is too low and should include economic imports. While changes were not made to this version of the Stack Analysis, the CEC will continue evaluating methods to best represent availability of reliable imports during extreme weather events.

Inputs and Assumptions

Table 1: Demand-Side Assumptions

Demand Category	Assumptions
Base Demand	Hourly IEPR 2020 Update Adopted Mid-Mid Demand for Year 2022[5]
Drought Adjustment to Demand	200 MW to 400 MW decrease in peak period demand due to water agency pumping loads, consistent with impacts in 2021

Source: California Energy Commission staff

5 https://efiling.energy.ca.gov/getdocument.aspx?tn=236297-6

Table 2: Supply-Side Assumptions

Supply Category	Assumptions
Baseline Resources	Monthly NQC values from California ISO 2021 NQC List. Solar resources are converted to an hourly shape based on CEC PLEXOS model solar profiles.
Hydro Drought Derate	Up to 1,500 MW derate to California hydro capacity, reflecting continued drought into 2022. Derate is 500 MW greater than summer 2021.
Imports	Average 2015-2020 California ISO RA showings plus POU 2021 firm liquidated damage contracts 5,372 MW July 6,426 MW August 6,240 MW September
Demand Response	IOU and POU totals decremented by 40% to account for effectiveness factors and incremented by 15% to account for reserves 1,054 MW July 1,063 MW August 1,060 MW September
New Demand Response and ELRP	176 MW carryover from 2021, incremented by 15% to account for reserves
Retirements	834 MW Redondo Beach Units 5, 6 and 8 retired
CPUC Procurement Between 2021 and 2022	CPUC Expedited Procurement carry over of 787 MW from 2021 CPUC Procurement of 1,270 MW by August 2022 CPUC Procurement of 363 MW by September 2022

Source: California Energy Commission staff

Table 3: PRM Assumptions

Demand Curve	PRM Assumptions
Extreme Weather	22.5% PRM: 6% for Operating Reserves, 7.5% for Outages, 9% for demand variability (similar to 2020 demand variability from a 1-in-2 forecast)
Average Weather	15% PRM: 6% for Operating Reserves, 5% for Outages, 4% for demand variability

Source: California Energy Commission staff

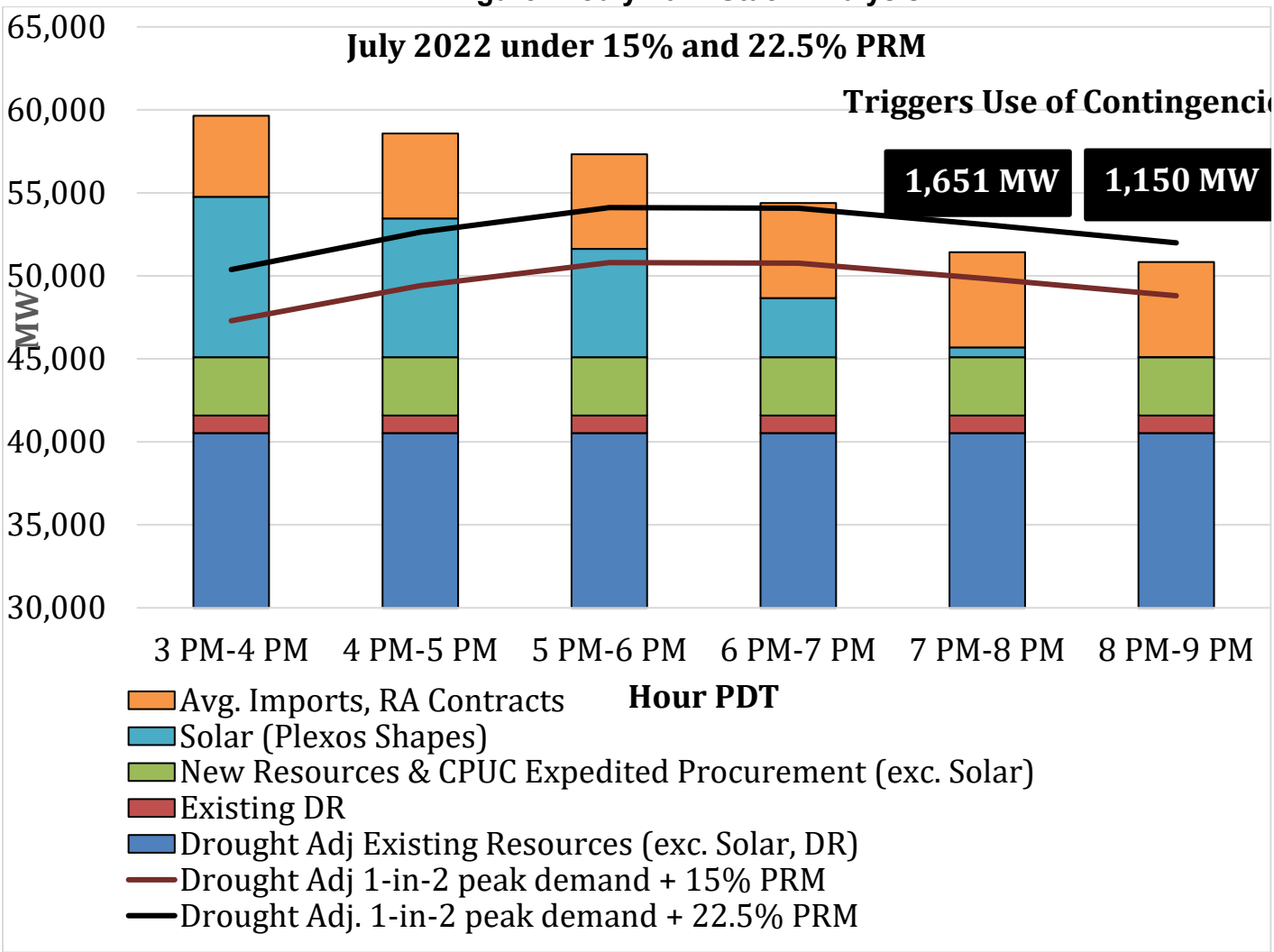
Results

With the revised assumptions outlined above, the 2022 Summer Stack Analysis tool projects smaller levels of trigger contingency requirements for 2022 compared to the CEC's Draft Stack Analysis. This projection affects the amount and duration of trigger contingencies, which are projected to be lower than in the draft analysis. Figures 1-3 display July, August, and September 2022 hourly results, respectively. There may still be a need for significant contingency resources or additional procurement in summer 2022 under the 22.5 percent PRM demand curve. The contingencies range in amount from just over 200 MW to 4,350 MW, assuming a 22.5 percent demand curve. Under a 15 percent demand curve, contingencies are projected to occur only in September in the evening, after peak-demand hours.

Conclusions

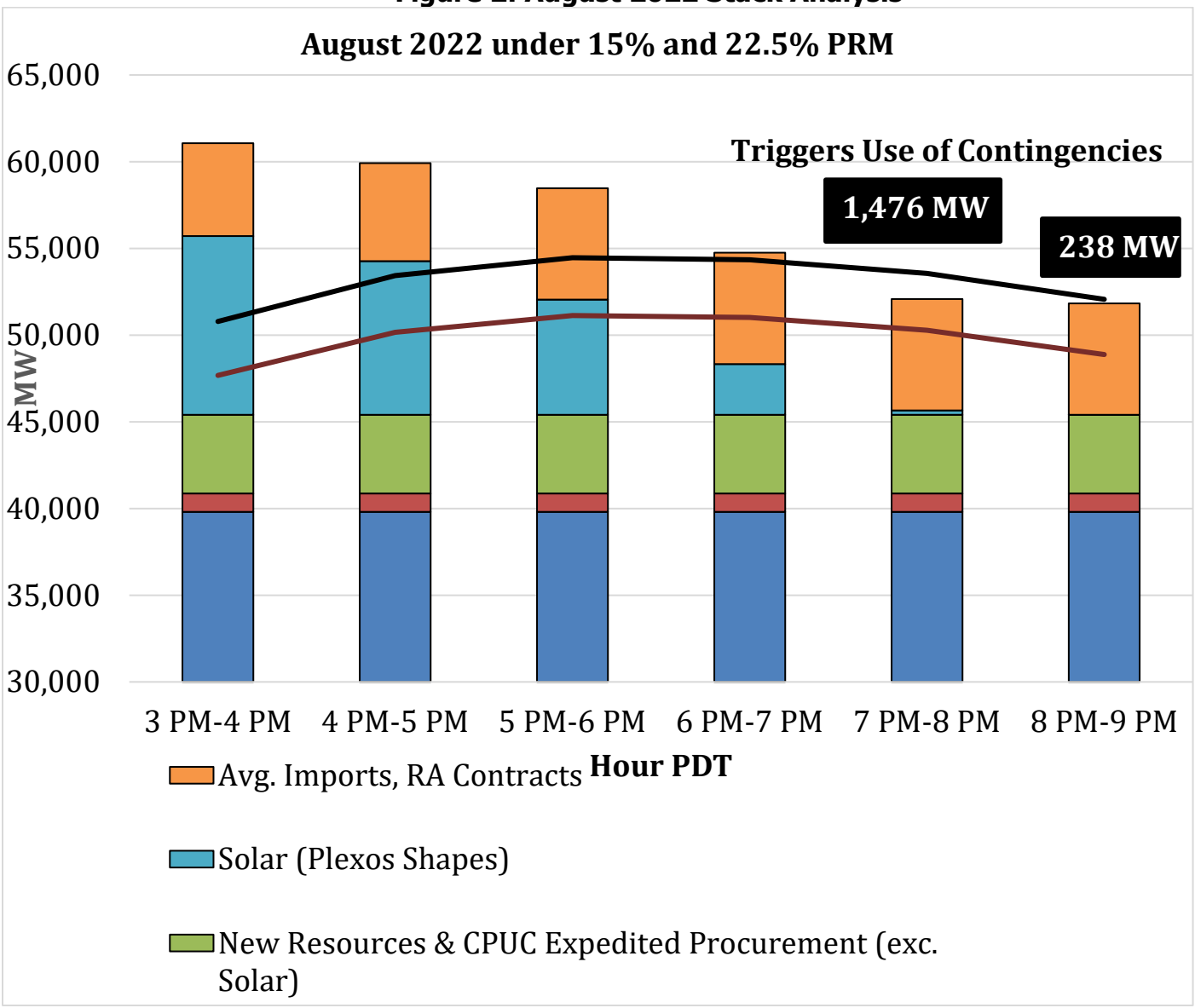
The Summer 2022 Stack Analysis identifies the risk of potential energy shortfalls under average and extreme weather planning reserve margins. This analysis projects that, assuming there is no additional procurement, an additional 200 MW to 4,350 MW of contingency resources may be required to ensure electric system reliability for peak and net-peak hours during summer 2022 under extreme weather events. Additional resources may be needed to provide electric system resilience against climate-induced drought and extreme heat events in California as well as wildfire-related outages or westwide heat events compromising interstate energy transfers.

Figure 1: July 2022 Stack Analysis



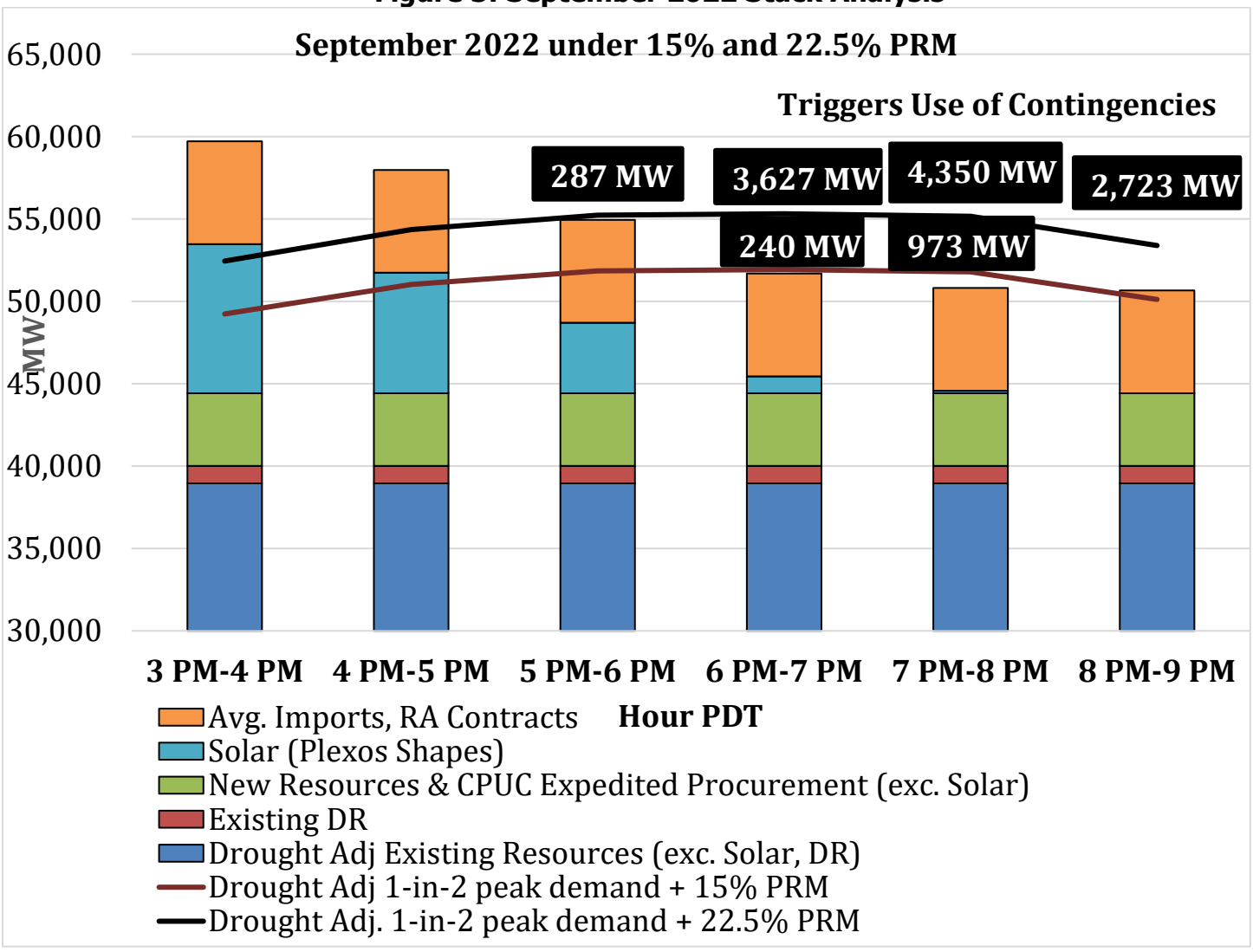
Source: California Energy Commission staff

Figure 2: August 2022 Stack Analysis



Source: California Energy Commission staff

Figure 3: September 2022 Stack Analysis



Source: California Energy Commission staff

Stakeholder Comments

Summary of Comments on CEC Draft 2022 Summer Supply Stack Analysis

Table 1: Southern California Edison

	Summary of Comments	Response to Comments
1	The shortfall of up to 5200 MW is driven by conservative assumptions, and the extreme case should be considered an upper bound. The 9% weather variability in the extreme case is equivalent to a greater than 1-in-20 weather event. SCE recommends using CEC's extreme weather demand without applying conservative assumptions to the generation stack.	Staff developed conservative assumptions and considers 9% a reasonable, but conservative, impact of extreme weather on demand. Staff also applied a conservative weather event impact on supply in the form of a 7.5% forced outage rate. This forced outage rate is intended to consider n the impact of persisting drought, wildfire and smoke impacts on the supply fleet.
2	SCE proposes using 2579 MW more supply (1500 MW hydro + 1079 MW imports).	No change recommended. The 1,000 MW hydro derate is based on DWR updated information (DWR current projections for its 3 facilities minus California ISO NQC value). The additional 500 MW derate reflects continuing drought conditions into next year, while the hydro NQC values are based on an average of historic operations. The extreme weather scenario assumes a west-wide heat event with no economic imports available to the California ISO.
3	SCE urges the state to use a stochastic loss of load expectation LOLE analysis as a check on the Draft 2022 Stack Analysis findings and inform potential supply- and demand-side actions to address emergency reliability needs in summer 2022.	Staff agree that a LOLE analysis is required and appropriate to plan for procurement. Staff iterate here that the hourly Stack Analysis was not developed to address procurement, but to plan for contingencies. CEC presented results of its stochastic analysis on August 30, which are used as a check on the results of the Stack Analysis.
4	SCE disagrees with the 1500 MW hydro derate and states that the qualifying capacity of hydro already reflects their availability during drought conditions.	See answer above, line 2.
5	Average RA import levels are not representative of import availability during peak hours or consistent with historical experience. SCE proposes including economic imports of 1079 MW (Sept. value) and states that a total of 7000 MW of imports were realized during the 2020 extreme heat event.	See answer above, line 2.
6	The retirement of Redondo Beach 834 MW should be updated once the State Water Board votes on whether to extend the OTC compliance date to December 31, 2023.	Staff agrees.
7	Using 7.5% forced outage rate in the planning reserve margin along with NQC values results in over-counting some forced outage rates. Hydroelectric and geothermal resource NQC values already account for forced outage rates. SCE does not recommend making any changes but notes that the results will be more conservative.	Staff agrees. No change recommended.
8	SCE is not clear whether Additional Achievable Energy Efficiency is included in the 2020 CEC IEPR Update Mid Demand and recommends that Managed Net Load forecast be used in the analysis.	No change recommended. The 2020 CEC IEPR Update Mid Demand with Mid Additional Achievable Energy Efficiency was used in the analysis.

Table 2: Pacific Gas and Electric Company

	Summary of Comments	Response to Comments
9	PG&E requests that the CEC clarify how this analysis will be used to enable proper review from stakeholders. Several assumptions seem conservative. PG&E is concerned about the unintended application of these results in other state agencies' proceedings.	The Stack Analysis may be referenced in other energy related proceedings as a possible data points of reference for the record, but any proceeding will consider the totality of the record in making any decision.
10	PG&E recommends that the CEC and other state agencies avoid the continued use of 22.5% planning reserve margin without validating it through a comprehensive analysis. The CPUC IRP proposed decision includes findings of fact #1, "More analysis is needed before revising the planning reserve margin for long-term planning in the IRP proceeding on a permanent basis." PG&E recommends that the joint agencies initiate this process with stakeholders in 2021 to determine a new, if applicable, PRM.	The CPUC D 21-06-035, decision requiring procurement to address mid-term reliability 2023-2026, adopts the high need scenario that effectively models a 22.5% PRM, but acknowledges it's an interim PRM to be used in the medium term. Staff believes formal revisions to the PRM will be considered in the CPUC's RA process.
11	Recent analysis by CPUC Energy Division's staff provides evidence that enforcing a 22.5% PRM results in LOLE lower than the industry standard 0.1 LOLE. This heightens the urgency to update the target LOLE and the resulting PRM through a thorough process vetted by stakeholders.	Staff acknowledges the reference to the ALJ's ruling seeking comments on the proposed preferred system plan page 20 but provides no further comment.
12	CEC should release the workpapers for stakeholders to review the assumptions. The summary of assumptions released on August 11, 2021 do not provide sufficient detail.	The Stack Analysis Tool is currently intended for internal use only, spreadsheet based with about 30 interdependent tabs. Over the next few months, time is required to make the tool, including workpapers publicly available. Until that time, when the tool can be shared publicly, staff is providing any specific data upon request.
13	The hydroelectric assumptions do not detail if the derates are from resource adequacy (RA) net qualifying capacity values or are incremental derates based on another baseline. Further, it is difficult to assess the right level of incremental hydro derates without reviewing the National Oceanic and Atmospheric Administration (NOAA) data.	See answer above, line 2.
14	The Stack Analysis includes new energy resources and appears to show these resources as being available for all six hours that were assessed. PG&E requests that CEC detail the resource mix that is expected, any forecasted delays in online dates, and the availability and time of charge and discharge for any energy storage that is included in this mix.	The Stack Analysis assumes NQC values for existing resources and new resources except for solar resources. Solar resources are captured on an hourly basis based on the PLEXOS solar shapes. Staff acknowledges that DR or batteries may not be available during the entire six-hour period from 3 pm to 9 pm, but surpluses exist between 3 pm to 5 pm. The shortfall is greatest in the single 7 pm to 8 pm hour and lower in the surrounding hours. The reduced shortfalls in the surrounding hours indicates that fewer resources such as DR and batteries will be needed. Staff assumes that DR and batteries will be optimized and not run at full output longer than 4 hours, to resolve the shortfalls.
15	The Stack Analysis indicates that PLEXOS solar profiles were used but it does not include details of the assumptions underpinning these shapes. PG&E also seeks clarification on the wind resources included in the Stack Analysis.	The PLEXOS hourly solar shapes are based on several years of historical data by geographic region. For new solar resources, staff applies the generic solar shape. Wind resources are based on wind ELCC values and staff acknowledges this shortcoming. Until that time, when wind profiles are available for the extreme weather scenario, staff will continue to use the monthly wind ELCC value.

Table 3: Middle River Power

	Summary of Comments	Response to Comments
16	MRP has an overarching concern that the Stack Analysis does not ensure whether additional procurement allows the system to meet a 0.1 loss of load expectation. The energy agencies must undertake the more thorough stochastic analysis needed to assess the reliability need and determine what resources are required to meet the 0.1 LOLE standard in the most cost-effective way.	Agree with commenter, the Stack Analysis is not intended to drive near term procurement, only to inform energy proceeding of the potential amount and duration of triggers contingencies that may be needed under extreme weather events. CEC staff presented stochastic analysis at an IEPR workshop on August 30, 2021.
17	MRP supports using PRM component higher than 1.5% to account for demand variability in the PRM. Again, MRP recommends stochastic analysis to determine whether 22.5% PRM will result in maintaining a 0.1 LOLE.	CEC staff notes the 1.5% demand variability was a mistake in the draft white paper, the 15% PRM assumes 6% reserves, 5% forced outage rate and 4% demand variability. The 22.5% PRM assumes 6% reserves, 7.5% forced outage rate and 9% demand variability.
18	The Stack Analyses appear to assume that DR is available between 3-9 pm which is questionable whether it would be available longer than 4 hours. This assumption should be amended or justified.	See above, line 14.
19	The Stack Analysis appears to mix capacity and energy. The drought-adjusted existing resources (excluding solar and DR) which includes wind and solar does not change across the hours. MRP recommends that for variable resources (i.e., solar, wind, and DR programs), the analysis should use conservative estimated hourly profiles rather than static MW capacity values associated with RA NQC values.	See above, line 14.
20	The average import values appear to be the same across the months, greater than 5000 MW. MRP supports only using RA contracted import values and no economic imports and recommends conservative assumptions be used. MRP raised concern about using historical average RA contracted imports. California ISO was a net exporter on July 9, 2021 (California ISO's peak demand to date) across its peak gross demand, and net imports were only 2000-2500 MW during net peak demand. The lower imports were due to numerous reasons such as transmission outages due to fire and high loads in neighboring states.	The average import RA values do vary across the months and are based on California ISO assumption.
21	The analysis assumes in-state generation will be available to serve California ISO load at the current levels for the indefinite future, but MRP has been approached by out-of-state load serving entities offering multi-year contracts. If in-state generation has been contracted to out-of-state LSE's, the analysis should account for the fewer resources available.	Staff does not have information on actual contracts and is not aware of in-state generation that has been contracted to out-of-state LSE's.
22	The analysis assumes that nearly 5000 MW of new resources are available for August 2022 and for a six-hour strip. If the resources are 4-hour battery storage, the analysis should reflect the shorter duration, which could result in shortfalls in other hours.	See above, line 14.

23	5000 MW are assumed for August 2022 and 4000 MW are assumed for Sept. 2022. The difference between these values is unclear if they are capacity values. If they area energy values, it is unclear why the hourly values are constant and not shaped.	The 5000 MW and 4000 MW of new resources for August and September, respectively, reflect monthly NQC values for the new resources except for a small portion of solar that is modeled on an hourly basis.
24	MRP recommends the CEC move beyond the simplistic Stack Analysis to the data rich stochastic LOLE analysis to ensure that the scenario will achieve a 0.1 LOLE.	See above, line 16. CEC staff plans to develop year ahead Stack Analysis in addition to the stochastic LOLE analysis as additional data points when considering extreme weather events.
25	The results of the Stack Analysis cannot be directly translated to revised requirements associated with the RA program and require additional steps to be converted to RA program requirements. For example, the RA program allows solar resources to count towards HE 19 to HE 20, but the Stack Analysis shows little if any contribution. Because the resource stacks for the gross load peaks may not be deficient, capacity procured to meet net load peaks may lead to a surplus of capacity to meet the gross load peaks, which could displace capacity needed to meet the gross and net load peaks.	The Stack Analysis intends to present a range of results based on an average weather conditions and extreme weather conditions, reflective of weather observed in 2020. The Stack Analysis highlights the risk during the net peak hours when solar is unavailable. Staff recognizes that using RA accounting rules for solar would undercount availability during gross peak hours and overcount availability during net peak hours, and the Stack Analysis corrects for the under and over counting of solar resources.
26	MRP requests supporting data for the graphs in numerical form with as much resource-type specific information as possible.	The Stack Analysis Tool is currently intended for internal use only, spreadsheet based with about 30 interdependent tabs. Over the next few months, time is required to make the tool, including workpapers publicly available. Until that time, when the tool can be shared publicly, staff is providing any specific data upon request.

Source: California Energy Commission staff

Enclosure 4

AMENDMENT TO THE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING

TO EXTEND THE COMPLIANCE SCHEDULE FOR THE REDONDO BEACH GENERATING STATION

FINAL STAFF REPORT

State Water Resources Control Board
October 19, 2021

State of California
Gavin Newsom, Governor

California Environmental Protection Agency
Jared Blumenfeld, Secretary

State Water Resources Control Board
https://www.waterboards.ca.gov/

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Eric Oppenheimer, *Chief Deputy Director*
Karen Mogus, *Division of Water Quality Deputy Director*

Prepared by:

Division of Water Quality
State Water Resources Control Board
California Environmental Protection Agency

Table of Contents

Abbreviations and Acronyms

Abbreviation or Acronym	Full Name or Phrase
2020 OTC Policy Amendment	Amendment to Revise Compliance Schedules for Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach Generating Stations and Diablo Canyon Nuclear Power Plant
AES	AES-Southland, Inc.
AQMD	Air Quality Management District
BAA	Balancing authority area
CAISO	California Independent System Operator
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
Coastal Commission	California Coastal Commission
CPUC	California Public Utilities Commission
CWA	Clean Water Act
DDT	Dichlorodiphenyltrichloroethane
EIR	Environmental Impact Report
ELCC	Effective Load Carrying Capacity
HE	Hour ending
LSE	Load serving entity
MGD	Million gallons per day
MW	Megawatt
Resources Agency	California Natural Resources Agency
NOV	Notice of violation
NPDES	National Pollution Discharge Elimination System
OTC	Once-through cooling
OTC Policy	Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling
PCB	Polychlorinated biphenyl
PDT	Pacific daylight time
PRM	Planning reserve margin
RA	Resource adequacy
Redondo Beach	Redondo Beach Generating Station

Regional Water Board	Regional Water Quality Control Board
SACCWIS	Statewide Advisory Committee on Cooling Water Intake Structures
SB 100	100 Percent Clean Energy Act of 2018
SB 350	Clean Energy and Pollution Reduction Act
SED	Substitute environmental document
SLH	SLH Fund, LLC
State Water Board	State Water Resources Control Board
TMDL	Total maximum daily load
TSO	Time schedule order
U.S. EPA	United States Environmental Protection Agency

1. Executive Summary

The State Water Resources Control Board ("State Water Board") is considering an amendment to the statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling ("Once-Through Cooling" or "OTC Policy") to extend the compliance date for Redondo Beach Generating Station Units 5, 6, and 8 ("Redondo Beach") for two years, from December 31, 2021, through December 31, 2023.

The OTC Policy establishes uniform, technology-based standards to implement federal Clean Water Act (CWA) section 316(b) and reduce the harmful effects associated with cooling water intake structures on marine and estuarine life. The State Water Board adopted the OTC Policy on May 4, 2010, under Resolution Number (No.) 2010-0020, and the Office of Administrative Law issued its approval on September 27, 2010. The OTC Policy became effective on October 1, 2010, and was amended in 2012, 2014, 2016, 2017, and 2020.

Originally, nineteen power plants located along the California coast withdrawing coastal and estuarine waters for cooling purposes using a single-pass system known as once- through cooling (OTC) were required to comply with the OTC Policy. Cooling water withdrawals cause adverse impacts when larger aquatic organisms, such as fish and mammals, are trapped against a facility's intake screens (impingement) and when smaller marine life, such as larvae and eggs, are killed by being drawn through the cooling system and exposed to high pressures and temperatures (entrainment).

The joint-agency Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS) was created to advise the State Water Board on the implementation of the OTC Policy, ensuring the compliance schedule takes into account the reliability of California's electricity supply, including local area reliability, statewide grid reliability, and permitting constraints. The SACCWIS includes representatives from the California Energy Commission (CEC), California Public Utilities Commission (CPUC), California Coastal Commission ("Coastal Commission"), California State Lands Commission, California Air Resources Board (CARB), California Independent System Operator (CAISO), and the State Water Board.

The OTC Policy includes compliance dates for the nineteen power plants based on the planning and electricity procurement processes of the CEC, CAISO, and CPUC. These compliance dates were scheduled with orderly retirements and planned replacement of capacity aimed at maintaining local and system-wide electrical grid reliability in the State of California. The SACCWIS meets at least annually to review grid reliability studies from CAISO and Los Angeles Department of Water and Power and receive status updates on compliance from coastal power plants. Ten of the original nineteen power plants have permanently retired since adoption of the OTC Policy, and one power plant

complied with Track 2 of the OTC Policy. The eight remaining power plants are scheduled to comply by specific compliance dates within the next decade, as presented in Table 1 of the OTC Policy.

On September 1, 2020, the State Water Board amended the OTC Policy ("2020 OTC Policy Amendment") under Resolution No. 2020-0029, which extended the compliance dates of four OTC power plants that were originally scheduled to comply by December 31, 2020. Redondo Beach was extended by one year, and three other OTC power plants were extended by three years, as detailed in Section 2.1 below.

In August 2020, preceding the adoption of the 2020 OTC Policy Amendment, swaths of the western United States encountered a prolonged and extreme heat wave in August 2020. This led to a series of circumstances that ultimately required the CAISO to initiate rotating outages in its balancing authority area (BAA) to prevent wide-spread service interruptions. Since that time, critical analysis and uncertainties have sparked efforts from the CPUC, CAISO, and CEC to revise their forecasting models and have highlighted the need for additional capacity beyond summer 2021.

As a result of the heat wave and a subsequent directive from Governor Gavin Newsom to carry out a root cause analysis, the CPUC initiated Rulemaking (R.)20-11-003 to consider a suite of actions within its authority to address potential grid reliability issues starting in summer 2021. The CPUC adopted Decision (D.)21-02-028 on February 11, 2021, which directed the three investor-owned utilities to seek contracts for energy capacity that will be available for the net peak demand in the summer of 2021. Building on R.20-11-003, the CPUC subsequently adopted D.21-03-056 on March 25, 2021, to direct investor-owned utilities to take actions to decrease peak and net peak demand and increase peak and net peak supply in the summers of 2021 and 2022.

While procurement efforts are still ongoing, a comprehensive stack analysis conducted by the CPUC, CAISO, and CEC indicates that additional procurement is needed to mitigate grid reliability concerns, including projected shortfalls in summer 2022. Further, the CPUC, CAISO, and CEC spotlighted critical uncertainties associated with energy supply and demand that warrant additional capacity in summer 2023.

On March 26, 2021, the SACCWIS adopted the Final 2021 Report of the SACCWIS ("Final 2021 SACCWIS Report"), recommending the State Water Board consider extending the compliance date of Redondo Beach Units 5, 6, and 8 for two years through December 31, 2023. The power generated by Redondo Beach will help partially offset projected system-wide shortfalls during periods of high net peak demand.

This amendment to extend the compliance date for Redondo Beach to December 31, 2023, is similar to the 2020 OTC Policy Amendment in that the capacity

of Redondo Beach is needed as a temporary measure while both previously-enacted and ongoing actions are implemented to enhance grid reliability. The 2020 OTC Policy Amendment was supported by CPUC D.19-11-016, which addressed potential system reliability challenges. This amendment differs from the 2020 amendment primarily because actual system reliability events have demonstrated a need to re-evaluate the models and market practices that define California's grid and account for the hazards and uncertainties presented by climate change. Thus, while the underlying reason for the proposed extension of the compliance date for Redondo Beach is similar, this amendment is based on an updated analysis that reflects conditions that occurred during, and ultimately led to, the August 2020 blackouts.

The OTC Policy includes a provision that existing power plants must implement measures to mitigate the interim impingement and entrainment impacts resulting from cooling water intakes during operation until final compliance with the OTC Policy (Section 2.C(3)). Accordingly, the continued use of OTC waters by Redondo Beach will be subject to continued interim mitigation requirements as detailed in Resolution No. 2015-0057 until the power plant comes into final compliance. Further, total statewide OTC daily flow rates should not be significantly impacted by an extension of the Redondo Beach compliance date to December 31, 2023. Daily average OTC water use on a statewide scale is projected to be at or below design flow rates from the original OTC Policy compliance schedule when the policy was adopted in 2010.

Additionally, extending the compliance date of Redondo Beach will extend existing air, noise, and aesthetic impacts; however, impacts are expected to remain less than the baseline condition established in the May 4, 2010 Final Substitute Environmental Documentation (SED, hereafter referred to as the 2010 Final SED).

2. Regulatory Background

2.1. Regulatory Background and Authority

In 1972, Congress enacted the CWA to restore and maintain the chemical, physical, and biological integrity of the nation's waters. CWA section 316(b) requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts.

In 2001, the U.S. Environmental Protection Agency ("U.S. EPA") adopted regulations for new power plants (Phase I) that established a performance standard for cooling water intakes based on closed-cycle wet cooling. In 2004, U.S. EPA published the Phase II rule applicable to existing power plants with a design intake flow greater than or equal to 50 million gallons per day (MGD), which was remanded following legal challenge. In May 2014, U.S. EPA finalized regulations covering existing facilities that withdraw at

least 2 MGD of cooling water. Facilities select from options designed to reduce impingement to meet best technology available requirements. Facilities that withdraw at least 125 MGD are required to conduct studies to investigate site-specific controls to reduce entrainment impacts. New units added to existing facilities are subject to similar requirements established for new facilities. The new regulation was published in the Federal Register on August 15, 2014, and became effective on October 14, 2014 (U.S. EPA, 2014).

The State Water Board is designated as the state water pollution control agency for all purposes under the CWA. The State of California's Porter-Cologne Water Quality Control Act of 1969 authorizes the State Water Board to adopt statewide water quality control plans and policies. The OTC Policy, adopted by the State Water Board on May 4, 2010, under Resolution No. 2010-0020, established requirements for the implementation of CWA section 316(b) for existing coastal power plants in California, using best professional judgment in determining best technology available for cooling water intake structures. The best technology available was determined to be closed-cycle wet cooling, or equivalent. The OTC Policy is implemented through National Pollutant Discharge Elimination System (NPDES) permits, issued pursuant to CWA section 402, which authorize the point source discharge of pollutants to navigable waters. The OTC Policy initially assigned the State Water Board as the entity responsible for issuing or modifying NPDES permits for power plants subject to the Policy. A subsequent OTC Policy amendment adopted pursuant to State Water Board Resolution No. 2013-0018 returned responsibility for these NPDES permits to the power plant's corresponding Regional Water Quality Control Board ("Regional Water Board").

On November 7, 2019, the CPUC adopted D.19-11-016, which directed load serving entities (LSEs) within its jurisdiction to procure 3,300 Megawatts (MW) of new capacity by August 1, 2023, and also recommended extensions of OTC Policy compliance dates for four OTC generators while procurement is underway.

On January 23, 2020, the SACCWIS recommended a modified extension schedule for the same four generators. On September 1, 2020, the State Water Board amended the OTC Policy under Resolution No. 2020-0029, which extended the compliance dates of the four power plants to address system-wide grid reliability in the CAISO BAA. This 2020 OTC Policy Amendment was approved by the Office of Administrative Law on November 30, 2020. The 2020 OTC Policy Amendment extended the compliance dates of four OTC power plants as follows:

- Alamitos Generating Station Units 3, 4, and 5 for three years, from December 31, 2020, through December 31, 2023;

- Huntington Beach Generating Station Unit 2 for three years, from December 31, 2020, through December 31, 2023;
- Ormond Beach Generating Station Units 1 and 2 for three years, from December 31, 2020, through December 31, 2023; and,
- Redondo Beach Generating Station Units 5, 6, and 8 for one year, from December 31, 2020, through December 31, 2021.

All facilities subject to the OTC Policy are required to comply with applicable regulatory requirements that are designed to minimize environmental impacts and protect human health, including all state and local permits. If the compliance date of Redondo Beach is extended, Redondo Beach would continue to be regulated by applicable air and water quality permits, therefore continuing to comply with requirements imposed in order to minimize environmental impacts and be protective of human health.

Because the OTC Policy requirements are equivalent to, if not more stringent than those contained in applicable U.S. EPA regulations, OTC Policy requirements continue to govern the existing coastal power plants in California. The U.S. EPA rule explicitly states that it is within the states' authority to implement requirements that are more stringent than the federal requirements.

2.2. Requirements When Amending the OTC Policy

The State Water Board must comply with all applicable state and federal public participation requirements and state laws governing environmental and peer review when amending a state policy for water quality control. However, the proposed OTC Policy amendment does not require peer review or a new CEQA analysis, as set forth more fully below and in Section 7.

To the extent that any approval constitutes a project within the meaning of the California Environmental Quality Act (CEQA), the State Water Board is the lead agency and is responsible for preparing any required environmental documentation for the amendment. The California Secretary of Resources has certified the State Water Board's water quality planning process as exempt from certain CEQA requirements when adopting plans, policies, and guidelines, including preparation of an initial study, negative declaration, and environmental impact report.

CEQA imposes specific obligations on the State Water Board when it establishes performance standards. Public Resources Code Section 21159 requires that an environmental analysis of the reasonably foreseeable methods of compliance be conducted. The environmental analysis must address the reasonably foreseeable environmental impacts of the methods of compliance, reasonably foreseeable alternatives, and mitigation measures. This amendment does not constitute a project

within the meaning of CEQA because it continues the status quo and does not result in any direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment beyond what was considered in the 2010 Final SED. State Water Board regulations governing CEQA do not apply when the State Water Board determines that the activity is not subject to CEQA. Title 23, California Code of Regulations, § 3720, subd. (b). While the amendment does not constitute a project within the meaning of CEQA, an addendum to the 2010 Final SED is included in Section 7 of this Staff Report in order to provide additional information about the amendment.

Health and Safety Code Section 57004 requires external scientific peer review of the scientific basis for any rule proposed by any board, office, or department within the California Environmental Protection Agency. However, because this amendment does not establish a new regulatory level, standard, or other requirement based on scientific findings, conclusions, or assumptions, peer review requirements do not apply.

3. Project Description

The State Water Board is considering an amendment to the OTC Policy to extend the compliance date of Redondo Beach Generating Station Units 5, 6, and 8 for two years, from December 31, 2021, through December 31, 2023, in order to address system-wide grid reliability concerns through 2023. This amendment is based upon the SACCWIS' analysis of alternatives and recommendations included in its final report adopted on March 26, 2021, and upon the rationale and considerations described in this Staff Report. This amendment would be reflected in Section 3.E, Table 1 of the OTC Policy.

4. Environmental Setting

Section 2.1 of the 2010 Final SED describes the environmental settings of regions with existing OTC power plants. Redondo Beach is located in Los Angeles County, and falls within the jurisdiction of the Los Angeles Regional Water Board (State Water Board, 2010). Sections 2.2 through 2.6 of the 2010 Final SED describe baseline environmental conditions associated with operation of coastal power plants using OTC.

5. Rationale and Considerations for Redondo Beach Compliance Date Extension

5.1. Grid Reliability

Events and Conditions Leading to the Amendment

System-wide grid reliability requires that power supply and demand must be equal at any given moment so as to avoid placing unnecessary stress on the electrical transmission system.

From August 14 through 19, 2020, large portions of the western United States encountered extreme and prolonged heat conditions. In swaths of California, temperatures were, on average, 10-20 degrees higher than normal, affecting some 32 million residents of the state. This climate change-induced event impacted both demand for and supply of generation. Under typical conditions, higher demand day-time periods are offset by cooler evening conditions. However, demand remained high for much of this heat wave due to elevated evening temperatures. Supply was unable to keep pace with elevated demand. Generation resources were constrained by the availability of light for solar resources, thermal impacts on equipment, and availability of water for hydroelectric generation. Normally, CAISO is able to mitigate reduced generation at least partially by importing electricity. However, because the heat wave impacted a large area of the West Coast of the United States, imports of electricity from other balancing authorities in the Western Interconnection grid were significantly reduced.

As a result of these extreme conditions, CAISO declared Stage 3 Emergencies on August 14 and 15, 2020. A Stage 3 Emergency occurs when load interruption is imminent or in progress, and CAISO is unable to meet minimum contingency reserve requirements promulgated by the North American Electric Reliability Corporation and the Western Electricity Coordinating Council regional variations as approved by the Federal Energy Regulatory Commission. To avoid uncontrolled load shedding that could destabilize other segments of the Western Interconnection grid, the CAISO coordinated efforts with utilities to conduct firm load shedding, leading to rotating but controlled blackouts for portions of California.

Stack Analysis and Actions Taken to Improve Grid Reliability

Following these events, the state's energy agencies initiated a series of actions to investigate the causes of the August 2020 blackouts and to reduce the likelihood of future blackouts under similar circumstances. On November 20, 2020, the CPUC issued R.20-11-003 to identify and execute all actions within its authority to ensure reliable electric service in the event of similar extreme heat waves. Additionally, Governor Gavin Newsom ordered the state's energy agencies to investigate and report on the root causes of the events leading to the August 2020 blackouts. These findings were included in the Final Root Cause Analysis Report published on January 13, 2021, and were primarily related to climate change-induced extreme weather conditions, availability of energy supply, and adequacy of market practices to meet associated energy demands.

Building on these efforts, the state's energy agencies conducted a comprehensive system-wide analysis, or stack analysis, to compare forecasted demand to the capacity of all existing resources and resources expected to be online in 2022. This stack

analysis was conducted using two planning reserve margin (PRM) scenarios. The PRM is comprised of a margin for required operating reserves, an allowance for above average demand, and a system-wide generator forced outage rate to meet demand during peak demand periods. The first scenario used a 15 percent PRM, which has been California's standard since 2004. The second scenario used a 17.5 percent PRM, which was recently adopted by the CPUC as an interim approach that effectively increases the PRM beginning summer 2021 to address the findings of the Final Root Cause Analysis Report. The 17.5 percent PRM is discussed in greater detail below.

The stack analysis demonstrated that energy supply is insufficient to meet projected demand in 2022. Specifically, the stack analysis projected a shortfall would occur during September 2022 with a 15 percent PRM and July and September 2022 with a 17.5 percent PRM. The shortfall reinforces the need for all available capacity to reduce the risks of blackouts and brownouts, and is discussed in greater detail below.

The stack analysis' projected deficit is conservative, as it assumes LSEs will contract with all existing and incremental resources known today. The stack analysis also assumes that all existing resources today (except for Redondo Beach) remain operational through summer 2022, incremental resources come online as expected, and LSEs are able to contract for all resources within the CAISO BAA, plus at least the five-year historical average level of resource adequacy (RA) imports. Additional assumptions and details pertaining to this exercise can be found in the Final 2021 Report of the SACCWIS.

In addition to decisions associated with R.20-11-003 and further reinforcing the need for all available capacity, energy agencies have taken actions to ensure all viable resources are available to bolster grid reliability in coming years. For instance, the CPUC adopted D.19-11-016 on November 13, 2019, which ordered procurement of 3,300 MW of incremental resources with 50 percent required to be online by August 2021. Fossil-fueled resources, such as the OTC plants, are not considered a part of this 3,300 MW of procurement. As a part of a separate proceeding (R.20-05-003), the CPUC adopted D.21-06-035 on June 24, 2021, to address mid-term reliability needs of the electricity system within the CAISO's BAA. This decision intends to address reliability needs by requiring at least 11,500 MW of additional procurement, with: 2,000 MW required by 2023; 6,000 MW required by 2024; 1,500 MW required by 2025; and 2,000 MW required by 2026. This procurement order is designed to achieve California's greenhouse gas emissions reductions targets for 2030 and to keep California on a clear path to meeting the goal of 100 percent zero-carbon electricity resources by 2045.

The CAISO recently acted to retain all viable resources in the near future. In 2020, the CAISO Board of Governors authorized the first-ever, system-level Reliability-Must-Run designation for approximately 400 MW of resources which had previously notified the

CAISO of their intent to retire or mothball. A Reliability-Must-Run designation is used to contract with a resource that is in its retirement process for the purpose of maintaining local, system, and flexible capacity reliability needs. In April 2021, the CAISO Board of Governors authorized another system-level Reliability-Must-Run for 38 MW of capacity from a cogeneration power plant. Designating system-level Reliability-Must-Run indicates that all resources within the CAISO system are needed to maintain grid reliability, including Redondo Beach. It should be noted that these resources were included in the stack analysis conducted in early 2021, so projected shortfalls are based on analysis that included all existing and functional resources.

As well as shorter-term Reliability-Must-Run actions, the energy agencies have undertaken actions to study grid reliability and its associations with climate change. For example, the CEC's Energy Research and Development Division, which develops long-term planning projections and targets, is engaged in efforts to improve future demand forecasts to account for climate change. This work is expected to begin by the end of 2021.

Finally, the CAISO has opened stakeholder processes to evaluate prioritization of electricity imports and exports. Electricity import and export markets play a vital role in the operation and maintenance of the nation's grids. During the August 2020 blackouts, the CAISO was scheduled to export electricity; however, the CAISO was import-dependent during all hours of the outage events, and in fact was a net importer of energy across all hours of both the day-ahead and real-time markets from August 13 through 15. Energy Imbalance Market transfers added another 1,500 MW of imports on August 14 and 600 MW of imports on August 15 when the CAISO declared Stage 3 emergencies on these dates.

The CAISO balances its responsibility to meet internal energy demands with its responsibility to collaborate with the rest of the Western Interconnection grid in maintaining an open and fair market. Exports ultimately play an important role in the operation of this regional system, upon which the CAISO depends for imports. However, in response to the August 2020 blackouts, the CAISO conducted a stakeholder initiative to ensure treatment of exports and native load are given the appropriate prioritization to maintain reliability. This initiative is supported by D.21-03-056, which noted that all eligible RA system resources supporting the effective 17.5 percent PRM are "visible to the CAISO as RA resources not eligible for export."

Planning Reserve Margin and Projected Shortfall in 2022

While the energy agencies were conducting a stack analysis in early 2021, the CPUC adopted D.21-02-028 on February 11, 2021. This Decision stemmed from R.20-11-003 and directed the three investor-owned utilities to seek contracts for expedited incremental capacity procurement available during the peak and net peak demand

period in summer 2021. It also anticipated a subsequent decision to address other reliability actions, such as demand-side measures, and 2022 capacity needs as necessary. Consequentially, the CPUC adopted D.21-03-056 on March 25, 2021, which laid out actions to both decrease energy demand and increase energy supply during peak demand and net demand peak hours in the summers of 2021 and 2022 for grid reliability. Specifically, this decision addressed: Flex Alert program authorization and design; modifications to and expansion of the Critical Peak Pricing Program; the development of an Emergency Load Reduction Program; modifications to existing demand response programs; modifications to the PRM as discussed in detail below; parameters for supply side capacity procurement; and expanded electric vehicle participation.

While D.21-03-056 did not order incentives to expedite procurement ordered under D.19-11-016 due to market considerations, it did reserve the right for CPUC to consider incentives for expedited procurement due to come online in August 2022 or August 2023.

Through D.21-03-056, the CPUC modified the PRM on a temporary basis in the summers of 2021 and 2022. This Decision underpinned the need for retention of all available capacity during summer months in 2022, such as Redondo Beach. In previous testimony, the CAISO had recommended an increase of the PRM from 15 to 17.5 percent, to "account for increased levels of forced outages currently being experienced by California's fleet." The CAISO also suggested applying this modified PRM when solar generation is at or near zero, which typically coincides with the net peak demand period in summer months.

In considering the PRM modification, the CPUC noted a suite of challenges that would inhibit a permanent change and would likely require a separate proceeding, including: changing system RA requirements mid-year and developing an associated penalty and waiver process; revising RA program rules to reflect solar generation; coordination with individual LSEs to meet this new requirement in addition to procurement directed for investor-owned utilities to perform on behalf of all LSEs in associated service territories; and emergency program triggers and associations with RA requirements. The CPUC also found that broad changes to RA requirements and resource planning metrics should be made in associated RA and resource planning proceedings. Simultaneously, the CPUC acknowledged the need for expeditious procurement of additional resources in light of the August 2020 blackouts and the potential for similar and more frequent events in the future.

Therefore, the CPUC adopted an interim PRM increase of 2.5 percent of the forecasted peak demand of CPUC's jurisdictional LSEs and directed the three investor-owned utilities to procure associated additional resources in 2021 and 2022. It should be noted

that the PRM increase is targeted and temporary to maximize grid reliability in the short-term while minimizing the risks of market changes that could detrimentally impact ratepayers. Further, the PRM increase is not directly connected with the RA program, since some procurement under the 2021 Emergency Reliability proceeding will not be eligible to participate in the RA program. Thus, the interim PRM should not be confused with potential or ongoing actions to bolster grid reliability in the long-term, such as a permanent PRM change that would apply to the RA program.

The interim PRM change was reflected in the energy agency's stack analysis conducted in early 2021. Based on only the existing and expected online incremental resources, there is a 2,563 MW projected shortfall in September under the 17.5 percent interim PRM, and a 414 MW shortfall in July, as shown in Table 1 below. Taking into account CPUC expedited procurement associated with D.19-11-016 and R.20-11-003, this shortfall is reduced to 1,063 MW in September 2022 under the 17.5 percent interim PRM, and the projected shortfall in July is negated, as shown in Table 2 below. It should be noted that the stack analysis projected a 70 MW surplus under the 15 percent PRM; however, the Final SACCWIS Report was adopted while CPUC proceedings associated with R.20-11-003 were still ongoing, and the adoption of D.21-03-056 negated this projected surplus by adopting the 17.5 percent interim PRM.

Table 1 provides the numerical comparison between the total resource stack versus the load for Hour Ending (HE) 8 p.m. Pacific Daylight Time (PDT), plus a 15 percent and 17.5 percent PRM.

Table 1: Surplus and Shortfall of 2022 Existing and Expected Online Resource Stack Without Redondo Beach as Compared to Load for HE 8 p.m. PDT Plus 15 percent and 17.5 percent PRM (MW)

Month	Existing and expected online resource stack without Redondo Beach	Load for HE 8 p.m. PDT	15% PRM plus load for HE 8 p.m. PDT	17.5% PRM plus load for HE 8 p.m. PDT	Resource stack minus 15% PRM plus load ([B] - [D])	Resource stack minus 17.5% PRM plus load ([B] - [E])
[A]	[B]	[C]	[D]	[E]	[F]	[G]
June	49,466	41,204	47,385	48,415	2,082	1,051
July	50,819	43,603	50,143	51,233	676	(414)
August	52,073	44,009	50,610	51,711	1,463	363
September	50,715	45,343	52,145	53,278	(1,430)	(2,563)
October	47,537	37,036	42,591	43,517	4,946	4,020

Note: In columns [F] and [G], a surplus is shown in black font and a shortfall is shown in red font within parentheses.

Table 2 below compares stack analysis projections for September 2022, the month with the largest anticipated shortfall, to CPUC staff estimates for expedited procurement that is effective at the 8 p.m. hour. Assuming the expedited procurement results in 1,500 MW of additional capacity that can effectively address energy needs during the net demand peak, there is still a 1,063 MW shortfall under the 17.5 percent interim PRM.

Table 2: Surplus and Shortfall for September 2022 Total Resource Stack as Compared to Load for HE 8 p.m. PDT Plus 15 percent and 17.5 percent PRM (MW)

		15% PRM	17.5% PRM
[1]	Existing and expected online resource stack	(1,430)	(2,563)
[2]	Estimated CPUC expedited procurement	1,500	1,500
[3]	Sub-total with only expedited procurement	70	(1,063)
[4]	Redondo Beach Units 5, 6, and 8 (RB)	834	834
[5]	Total with expedited procurement and RB	904	(229)

Note: A surplus is shown in black font and a shortfall is shown in red font within parentheses.

On August 11, 2021, the CEC released its Preliminary 2022 Summer Supply Stack Analysis. The CEC adopted a final revised version of this stack analysis on September 8, 2021. This stack analysis considered both a 15 percent PRM and a 22.5 percent PRM to provide electric system resiliency against climate change-induced drought impacts to hydroelectric generation and extreme heat events, as well as wildfire-related outages or west-wide heat events that threaten interstate energy transfers. The stack analysis analyzed the timeframe of July, August, and September 2022. Results of the stack analysis show a projected energy shortfall in September under the average demand curve using the 15 percent PRM, before counting Redondo Beach's net qualifying capacity. The demand curve using the 22.5 percent PRM projects energy shortfalls that range from approximately 200 MW to 4,350 MW, before counting Redondo Beach's net qualifying capacity. Either PRM scenario results in projected shortfalls that further indicate Redondo Beach's capacity is needed to partially offset the shortfalls during periods of high peak and net peak demand.

Grid and Energy Uncertainties in 2023

In developing the stack analysis, the energy agencies pointed to several uncertainties that inhibit the development of a conclusive stack analysis through 2023. These uncertainties include:

1. Whether authorized or proposed procurement will adequately address the net demand peak period;

2. Whether imports can be successfully contracted for up to at least the historical average RA levels despite tightening supply conditions in the rest of the West;
3. Whether resources assumed online today will remain so beyond 2021 and perform as expected;
4. Planning processes have not entirely changed to address high loads and the net demand peak but expedited actions seek to provide a stop-gap;
5. Processes that address additional procurement and market changes are still in progress, and once implemented, a fair amount of uncertainty regarding their effectiveness will remain, and;
6. Lastly, there are a variety of climate change-induced and real-time conditions that could negatively impact the operation of the fleet but are unknown until much closer to the operational period, such as drought, wildfire, and cloud cover, all of which may threaten the integrity or efficacy of generation or transmission assets.

Developing a definitive energy analysis, such as a stack analysis, for longer-term scenarios is a complex and challenging task. As noted in the Final 2021 SACCWIS Report, neither the 2022 nor 2023 net qualifying capacity lists are available. Current procurement authorizations are either currently in progress or not yet approved, and the RA program continues to evolve. Furthermore, LSEs are not required to report the entirety of their RA procurement until 45 days prior to the operating month. For example, the total procurement for September 2022 will not be fully known until mid-July 2022. Given these reasons, a stack analysis cannot be conducted for 2023 at this time.

While a conclusive stack analysis cannot be conducted for 2023 at this time, the CEC develops long-term energy projections that take into account a host of factors. As noted in the Final 2021 SACCWIS Report, the CEC produced a demand forecast for 2023 that shows approximately 500 MW of load increase at HE 8:00 pm Pacific Daylight Time between 2022 and 2023.

Taken together, these variables support Redondo Beach's extension through 2023. Additionally, extending the compliance date of Redondo Beach through 2023 would guarantee that its capacity remains available for contracting with LSEs in 2023. Further, an extension only through the end of 2022 may not allow State Water Board staff adequate time to prepare another OTC Policy amendment should a determination of another projected shortfall be made for 2023.

Alternatives and Findings from the March 26, 2021 SACCWIS Report

On March 26, 2021, the SACCWIS convened and approved the Final 2021 SACCWIS Report, which presents alternatives and a recommendation to the State Water Board to consider extending the OTC compliance date of Redondo Beach by two years to address the aforementioned system-wide grid reliability issues. The alternatives from the approved Final 2021 Report of the SACCWIS are listed below.

1. Alternative 1 (Recommended): Extend the compliance date for Redondo Beach Units 5, 6, and 8 for two years, through December 31, 2023.

   This alternative would ensure the availability of capacity from Redondo Beach for contracting during peak months and would help meet system reliability needs in summer 2022, as identified by the stack analysis. The second year of extension is necessary to address the uncertainty in the 2023 resource supply stack and the CEC's forecasted 500 MW increase in demand between 2022 and 2023.

   Even with an extension of Redondo Beach's compliance date, California may still experience blackouts or brownouts during times when electrical demand is high and imports are unreliable due to similar high demands in other states or BAAs, such as during extreme and prolonged heat waves. However, this risk would be reduced with the availability of capacity provided by Redondo Beach.

2. Alternative 2: Extend the compliance date for Redondo Beach Units 5, 6, and 8 for one year, through December 31, 2022.

   This alternative would ensure the availability of capacity from Redondo Beach for contracting during peak months and would help meet system reliability needs in summer 2022, as identified by the stack analysis. Similar to Alternative 1, California may still experience blackouts or brownouts during times when electrical demand is high and imports are unreliable due to similar high demands in other states or BAAs, such as during extreme and prolonged heat waves. However, this risk would be reduced in 2022 with the availability of capacity provided by Redondo Beach.

   While this alternative would partially offset shortfalls in 2022, it would not help meet system reliability needs in 2023. If a need is subsequently identified for additional capacity in 2023, there may not be enough time to conduct regulatory processes to amend the OTC Policy and further extend the compliance date. Similarly, depending on when a need is identified, the resource owner may not be capable of keeping the plant in service for an additional year.

3. Alternative 3: No action. Redondo Beach would stop using ocean water for OTC on or before December 31, 2021. California would be at higher risk of

experiencing blackouts or brownouts during times when electrical demand is high and imports are unreliable due to similar high demand in other states or BAAs.

At the March 26, 2021 meeting, the SACCWIS approved Alternative 1 as its preferred recommendation to the State Water Board. Section 3.B.(5) of the OTC Policy states that the State Water Board shall consider the SACCWIS' recommendations and, if appropriate, consider modifications to the OTC Policy. In the event that the SACCWIS energy agencies make a unanimous recommendation for implementation schedule modification based on grid reliability, the State Water Board shall afford significant weight to the recommendation.

Role of the SACCWIS

Before and during the development of the OTC Policy, the State Water Board consulted with the CAISO, CEC, and CPUC to build a feasible compliance schedule for the facilities under the OTC Policy to come into compliance with minimal impacts to the electric grid, based on the planning and electricity procurement processes of the state's energy agencies. These compliance dates were scheduled with orderly retirements and planned replacement of capacity aimed at maintaining local and system-wide electrical grid reliability in the State of California.

The compliance dates for the OTC Policy were originally developed based on a report produced by the CEC, the CPUC, and the CAISO, titled *Implementation of OTC Mitigation Through Energy Infrastructure Planning and Procurement Changes*, and the accompanying table, titled *Draft Infrastructure Replacement Milestones and Compliance Dates for Existing Power Plants in California Using Once Through Cooling,* as cited in the 2010 Final SED. The state's energy agencies designed the compliance dates to maintain reliability of the electric system and stated that the dates specified in their original report may require periodic updates.

Section 1.I of the OTC Policy describes the SACCWIS' role. Since energy regulation is outside of the expertise and authority of the State Water Board, the SACCWIS was created to advise the State Water Board on the ongoing implementation of the OTC Policy to ensure that the implementation schedule would be revised as appropriate to take into account the reliability of California's electricity supply, including local area reliability, statewide grid reliability, and permitting constraints. The SACCWIS meets at least annually to review grid reliability studies from the CAISO and the Los Angeles Department of Water and Power, and to receive status updates on compliance from once-through cooled power plant operators. The SACCWIS provides recommendations to the State Water Board if compliance schedule changes are needed to ensure the essential electrical power needs of the state are met. The SACCWIS includes representatives from the CEC, the CPUC, the Coastal Commission, the California State Lands Commission, the CARB, the CAISO, and the State Water Board.

Furthermore, each of the state's energy agencies that are part of the SACCWIS play a distinct role: the CPUC considers procurement authorizations for its jurisdictional LSEs and conducts system-wide reliability analyses; the CAISO conducts reliability analyses and examines infrastructure upgrades and additions in its transmission planning process; and the CEC evaluates and, when necessary, issues licenses to site new electric generation resources.

The SACCWIS' Memorandum of Agreement, which sets forth principles, procedures and agreements to which the signatory agencies of the SACCWIS commit themselves, states that the agencies and entities comprising the SACCWIS shall commit to working cooperatively towards fulfilling the obligations of the SACCWIS as described in the OTC Policy. The Memorandum of Agreement also states that it does not limit the rights or authority of any agency or entity participating in the SACCWIS.

Redondo Beach's Role in Grid Reliability

To effectively maintain balance in power supply and demand within a BAA, the responsible balancing authority continuously forecasts, monitors, and adjusts electrical supply to meet demand. Balancing supply and demand can be achieved through several processes, one of which is the dispatch of generation assets by the responsible balancing authority.

As power demand is variable and production is tied to an array of factors, some types of electrical generation assets are dispatched to serve load more frequently than others, while other generation assets are generally reserved for peak demand, or contingency, periods. The power plants reserved for peak demand periods are colloquially referred to as "peaker plants" or "peakers." To demonstrate an example of the role peakers play in maintaining grid reliability, energy usage typically spikes during heat waves, when air-conditioning usage is widespread. These periods often require the dispatching of peakers to serve load.

In the context of grid reliability, this means that spinning generators, such as OTC facilities, may require dispatch during peak demand periods. Peakers also play a role in maintaining grid reliability during emergency scenarios, such as natural disasters that damage, destroy, or otherwise require the shutdown of electrical generation or transmission infrastructure.

While Redondo Beach was originally constructed and used as a baseload resource, it now primarily functions like a peaker plant by remaining in a near-ready state, or "hot standby" status, that allows units to be brought online in short order. Between 2016 and 2019 (most recent year that annual capacity factors are available), Redondo Beach operated on total cumulative average at 2.7 percent of capacity. Redondo Beach is expected to continue operating like a peaker plant until its compliance date.

Further, it should be noted that capacity factors do not reflect the importance of a resource in maintaining grid reliability. While Redondo Beach has operated at a relatively low capacity factor in recent years, fossil-fueled OTC generators like Redondo Beach are typically dispatched when demand is high and the CAISO has limited other options to maintain grid reliability.

Additionally, the dispatch order of generation resources is generally driven by marginal costs of operation, where resources with lower marginal costs are typically dispatched before those with higher costs. The older age of many OTC units means they have higher marginal costs of operation. Since resources are generally dispatched when demand drives energy prices above those resources' costs, newer and more efficient existing resources are generally used before resorting to dispatching OTC power plants like Redondo Beach.

Although Redondo Beach may be dispatched last, its capacity is still needed to bolster grid reliability in 2022 and to compensate for the band of uncertainty that has been identified in 2023. Without its capacity, California would be more susceptible to potential blackouts or brownouts.

If future Integrated Resource Plan processes by the CPUC show that Redondo Beach is no longer necessary to ensure system-wide grid reliability through December 31, 2023, Redondo Beach's owner and operator could elect to retire the units early.

The Changing Nature of California's Grid

Balancing authorities employ a number of generation resources to ensure grid reliability. In California, renewable energy resources, such as wind and solar, are progressively playing a larger role in electrical generation, as required by the 100 Percent Clean Energy Act of 2018 (SB 100, De León) and the Clean Energy and Pollution Reduction Act (SB 350, De León). Incorporating renewable energy resources into the grid plays an important role in reducing greenhouse gas emissions and mitigating the impacts of climate change.

While wind and solar resources are increasingly playing a greater role in electricity production in California, they are inherently variable, as production is directly tied to wind and solar availability and activity. This variability is reflected in the Effective Load Carrying Capability (ELCC) and net qualifying capacity values of these resources. ELCC expresses the extent to which a resource is able to meet reliability conditions and reduce expected reliability problems or outage events (considering availability and use limitations), while net qualifying capacity is the number of Megawatts eligible to be counted towards meeting a LSE's system and local RA requirements, subject to deliverability constraints. Hence, renewable energy resources generally have a lower net qualifying capacity value compared to non-renewable forms of energy production.

The build-out of renewable resources poses a conundrum in which more energy is needed at precisely the time when solar is declining. In 2018, solar generation provided approximately 14 percent of California's total in-state generation. At night, some demand for electricity is served by wind generation. The remainder of the demand not served by solar and wind generation is known as the net demand, and it is served by other resources within the CAISO system, including fossil-fueled OTC power plants such as Redondo Beach. Further, on hot summer days, load may remain high well after sunset because of air conditioning demand. As the Final Root Cause Analysis demonstrated, resource planning targets have not kept pace to ensure sufficient resources are available that can be relied upon to meet demand in the early evening hours after sunset.

One potential solution to mitigate this issue is to develop facilities that can store energy during periods of elevated renewable generation, such as battery storage. Battery storage is increasingly playing a greater role in the operation of California's grid, yet currently constitutes a comparatively small portion of California's supply stack, and procurement and construction of new energy storage facilities takes time. Battery storage also poses operational uncertainties that require careful planning to mitigate.

Relation to 2020 Amendment

This amendment to extend the compliance date for Redondo Beach to December 31, 2023 is similar to the 2020 OTC Policy Amendment in that the capacity of Redondo Beach is needed as a temporary measure while both previously-enacted and ongoing actions are implemented to enhance grid reliability. The 2020 OTC Policy Amendment was supported by CPUC D.19-11-016, which addressed potential system reliability challenges. This amendment differs primarily by actual system reliability events that demonstrated a need to re-evaluate the models, and market practices that define California's grid and account for the hazards and uncertainties presented by climate change. Thus, while the underlying reason for the proposed extension of the compliance date for Redondo Beach is similar, this amendment is based primarily on an updated analysis that reflects previously unforeseen conditions that occurred during, and ultimately led to, the August 2020 blackouts.

Additionally, the State Water Board recognized in its adoption of the 2020 OTC Policy Amendment that the August 2020 blackouts were caused by a heat wave that could change energy projections and precipitate future OTC Policy amendments to support grid reliability. State Water Board Resolution No. 2020-0029 states the following at Finding 20: "Portions of California were subject to rotating power outages during mid-August 2020 due to unexpectedly high peak energy demands during widespread extreme high temperatures. The CPUC, CAISO, and CEC may be revising their forecasting models to account for this scenario, and may determine that there is a need

to request additional extensions of final compliance dates to maintain grid reliability and avoid similar blackouts in the future."

COVID-19 Pandemic Impacts on Procurement

At the time of the adoption of the 2020 OTC Policy Amendment, there were some concerns regarding the effects of the COVID-19 pandemic on grid reliability. The impacts of COVID-19 on reliability were analyzed by the CAISO through a backcast analysis as mentioned in the Final Root Cause Analysis. The backcast analysis removed large weather errors in order to isolate any potential impacts from the COVID-19 stay-at-home order within the March 17, 2020, to July 26, 2020 timeframe. Based on this analysis, CAISO did not observe significant load reductions when compared to pre-COVID-19 conditions and determined that the COVID-19 stay-at-home order did not impact grid reliability.

Also at the time of adoption of the 2020 OTC Policy Amendment, some individuals expressed concern regarding the impacts of COVID-19 on procurement associated with D.19-11-016. The first quarterly report submitted by the CPUC to provide updates on this procurement, as requested by Resolution No. 2020-0029, indicated that procurement is generally meeting targets. While CPUC staff indicated that 91 MW of the 1,750 MW required to be online by August 1, 2021 is delayed, no LSE indicated that it did not anticipate meeting requirements. The small portion of the procurement ordered online that is delayed did not impact the stack analysis conducted in early 2021 by the energy agencies.

Since the submission of the first quarterly report, CPUC staff indicated that sufficient resources have been procured to meet the 3,300 MW of new resources ordered by CPUC D.19-11-016; however, some projects expected to be online by August 1, 2021, have been delayed due to various reasons, including impacts associated with COVID-19.

5.2. Impacts to Marine Life

Sections 2.2 and 2.3 of the 2010 Final SED established baseline impacts to marine life through analysis of impingement and entrainment studies conducted from 2000-2005 at eighteen of the nineteen coastal OTC power plants. The consensus among regulatory agencies at both the state and federal levels is that OTC systems contribute to the degradation of aquatic life in their respective ecosystems. Installation of reasonably foreseeable methods of compliance were found to reduce either impingement or entrainment impacts by 90 percent to 97 percent, depending on the technology selected.

The 2010 Final SED showed that OTC units among the nineteen power plants operated at varying efficiencies (volume of cooling water in millions of gallons required per

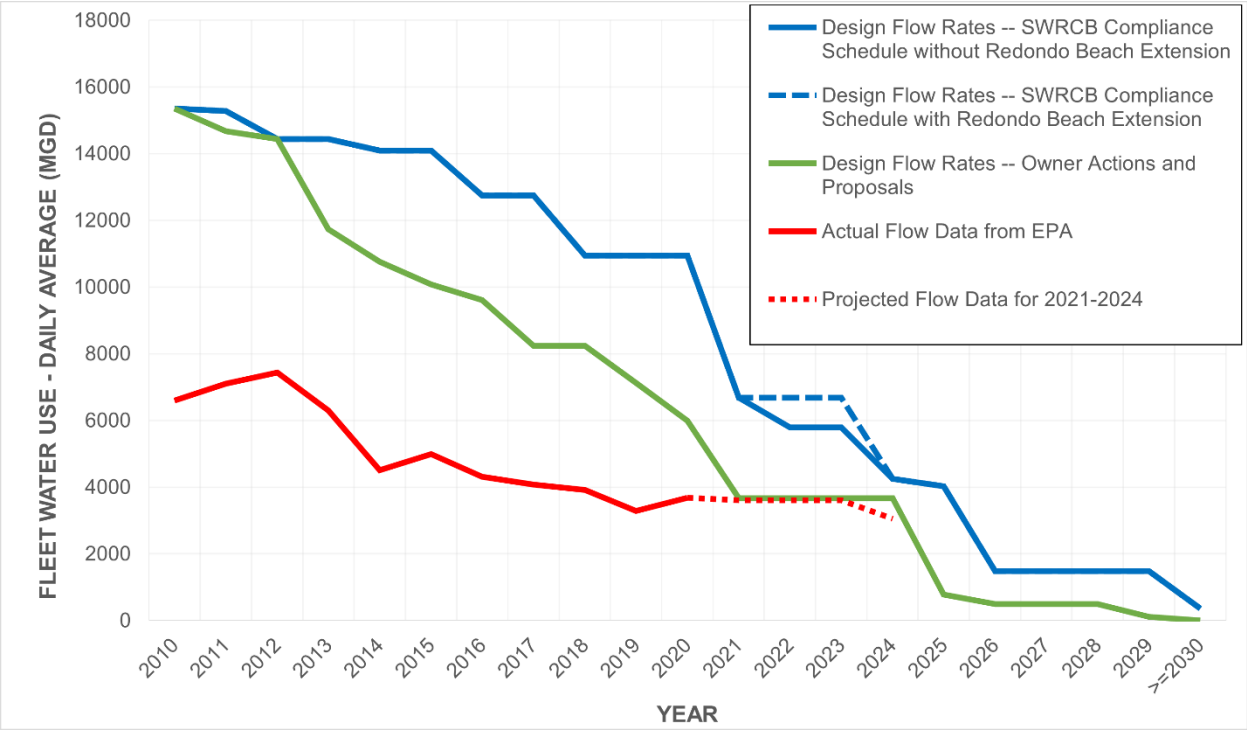
megawatt-hour generated), depending on the type of boiler system and general age of the unit. For example, combined-cycle units were found to be up to 50 percent more efficient than steam boilers. Redondo Beach Units 5, 6, and 8 are all steam boilers and are the oldest among the remaining OTC units, having been constructed in 1954 and 1957.

Since adoption of the OTC Policy, Redondo Beach has operated at decreasing capacities, with average annual capacity factors decreasing from 4.7 percent in 2012 to 1.6 percent in 2019. If its compliance date is extended, Redondo Beach is expected to operate at or below the annual average capacity factors from 2019, thereby minimizing impingement and entrainment impacts.

As shown in Figure 1, which displays the historic and projected water usage by the combined OTC fleet without and with a Redondo Beach extension, total statewide OTC daily flow rates should not be significantly impacted by an extension of the Redondo Beach compliance date to December 31, 2023. Additionally, daily average OTC water use on a statewide scale is projected to be at or below design flow rates from the OTC Policy compliance schedule, as amended, when the policy was adopted in 2010.

Based on these findings, impacts to marine life are expected to be at or below the baseline established in the 2010 Final SED if the compliance date for Redondo Beach is extended. See Section 7 of this Staff Report for additional discussion.

Figure 1: Historic and Projected Water usage by the Combined OTC Fleet With and Without a Redondo Beach Extension



5.3. Mitigation of Impacts to Marine Life

The OTC Policy includes a provision that existing power plants must implement measures to mitigate the interim impingement and entrainment impacts to marine life resulting from cooling water intakes during operation. This requirement commenced on October 1, 2015, and continues up to and until the owner or operator achieves final compliance. Section 2.C(3) of the OTC Policy provides options for owners or operators to demonstrate compliance with the interim mitigation requirements.

AES-Southland, Inc. (AES), owner and operator of Redondo Beach, elected to comply with the interim mitigation requirements through Section 2.C(3)(b) by providing funding to the Ocean Protection Council or California Coastal Conservancy to fund appropriate mitigation projects.

Since October 1, 2015, approximately $1.11 million in interim mitigation funds for the Redondo Beach facility have been paid by AES to fund appropriate mitigation projects. Payments are calculated in determinations prepared by State Water Board staff on an annual basis.

The process to calculate interim mitigation payments was approved by the State Water Board on August 18, 2015, in Resolution No. 2015-0057. The State Water Board previously contracted with Moss Landing Marine Laboratory to establish an expert review panel ("Expert Review Panel II") on minimizing and mitigating intake impacts from power plant and desalination facility seawater intakes. The Expert Review Panel II developed a mitigation fee for facility interim mitigation that would compensate for continued intake impacts due to impingement and entrainment, which was the basis of the interim mitigation calculation method set forth in Resolution No. 2015-0057. The interim mitigation payment calculation comprises an entrainment payment, an impingement payment, and a management payment for implementation and monitoring of the mitigation project. The entrainment fee calculation utilizes empirical transport models coupled with the habitat production forgone method, as required by the OTC Policy, and is based on the cost of creating or restoring habitat that replaces the production of marine organisms killed by entrainment.

In accordance with Resolution No. 2015-0057, interim mitigation payments are calculated annually for each individual OTC facility, comprising the elements discussed above. The entrainment calculation is based on the volume of OTC water used during the annual interim mitigation period multiplied by either a site-specific or default average cost of entrainment determined in the Expert Review Panel II's Final Report. Resolution No. 2015-0057 states that when site-specific entrainment data is available for a facility, the Executive Director of the State Water Board shall determine whether this data is suitable for calculating a specific habitat production forgone for that plan. Otherwise, owners and operators electing to comply with interim mitigation requirements consistent

with Section 2.C.(3)(b) use the default method for calculating the entrainment component of the interim mitigation calculation. Each site-specific or general entrainment rate is multiplied by a 3 percent escalator each year to update the average cost of entrainment to account for inflation. The impingement calculation is based on the pounds of fish impinged during the annual interim mitigation period multiplied by the average indirect economic value of the fisheries. The management and monitoring payment is calculated by taking 20 percent of the sum of the entrainment and impingement calculations.

The interim mitigation period commenced on October 1, 2015, and owners or operators are required to satisfy interim mitigation requirements until the OTC facilities achieve final compliance with the OTC Policy. Continued interim mitigation requirements apply if there are compliance date extensions.

Accordingly, the continued use of OTC waters from Redondo Beach will be subject to continued interim mitigation requirements as detailed in Resolution No. 2015-0057 up to and until the power plant comes into compliance with the OTC Policy. The interim mitigation requirements currently in place are sufficient to offset impingement and entrainment impacts incurred during the operation of Redondo Beach through 2021 or 2023.

5.4. Land Use Impacts

The 2010 Final SED concluded that no land use impacts were identified regarding OTC power plant compliance with requirements of the OTC Policy. This conclusion was based on the 2008 report by Tetra Tech, which evaluated the technical and logistical feasibility of retrofitting 15 of the state's fossil-fueled coastal OTC power plants with closed-cycle wet cooling systems (pages 104 and G-229, 2010 Final SED). Revisions to OTC Policy compliance dates based upon non-marine impacts to local communities, including land use concerns and environmental justice, may be considered but are largely beyond the scope of the State Water Board's authority under CWA section 316(b) and the OTC Policy.

Starting in 2018, AES entered negotiations for the sale of the Redondo Beach property to developer SLH Fund, LLC (SLH). At the time of the adoption of the 2020 OTC Policy Amendment, an agreement was in place for AES to lease back the property and continue operating Redondo Beach if the power plant's compliance date was extended by the State Water Board. In its May 18, 2020 comment letter to the State Water Board on the 2020 OTC Policy Amendment, SLH stated that during any extension of the power plant's compliance date, AES would provide it access to unused portions of the site for remediation, and that continuing operation of the power plant would not delay redevelopment efforts. The State Water Board is not party to negotiations or agreements between Redondo Beach's owner and operator and the land holder, and

State Water Board staff is unaware of the current status of the agreement between SLH and AES.

In 2019, the City of Redondo Beach received a grant from the California Natural Resources Agency ("Resources Agency") for $4.8 million for the partial purchase of 15 acres of the Redondo Beach property, including historical wetlands, for restoration as part of a regional park. In 2020, the Resources Agency confirmed that the power plant's compliance date extension beyond December 31, 2020, would not affect this grant funding for the City of Redondo Beach. The Resources Agency has since informed the State Water Board this grant was terminated in January 2021. According to the Resources Agency, the City of Redondo Beach submitted a letter regarding the seller's retraction of the offer to sell along with a request to reallocate the grant acquisition to another property adjacent to the power plant site. The Resources Agency was unable to accommodate the request as property substitutions are not allowed once the grant is awarded and the grant program guidelines require an acquisition project to have a willing seller.

In 2015, the Coastal Commission confirmed jurisdictional wetlands exist in the former tank basin area on the Redondo Beach property, totaling 5.93 acres. In 2017 and 2018, AES submitted applications for and received three emergency coastal development permits to dewater the former tank basin and was denied a fourth. The pumping, or dewatering, occurred due to safety concerns regarding water near utility and electrical lines. Sometime before May 2020, AES stopped using the groundwater pumping system and installed portable sump pumps in utility vaults. However, pumping continued due to similar safety concerns regarding water near utility and electrical lines.

The Coastal Commission issued a Notice of Violation (NOV) to AES and SLH on May 26, 2020, for illegally dewatering the wetlands through the unpermitted installation and use of groundwater pumps in the former tank basin area and the installation and use of new portable pumps to dewater utility vaults that may be hydrologically connected to the wetlands in the former tank basin. The Coastal Commission has indicated that AES has since complied with the violation and completed the following actions to address the NOV:

- AES ceased any unpermitted dewatering of the former tank basin area;
- AES submitted by June 30, 2020, a complete coastal development permit application to the City of Redondo Beach seeking authorization to remove the dewatering system in the former tank basin and either retain or remove the vault pumping system, and;
- AES submitted to the City of Redondo Beach and the Coastal Commission by June 30, 2020, a response to information requests in the NOV related to the vault pumping system.

According to information provided by the Coastal Commission, AES' coastal development permit application submitted by June 30, 2020, provided alternatives to dewatering the former tank basin. The City of Redondo Beach, which administers a Local Coastal Program, is in the process of reviewing the alternatives submitted.

As of August 2021, the Coastal Commission indicated to State Water Board staff that it is not aware of any unpermitted dewatering events occurring in the past year. The Coastal Commission also acknowledged that it still considers the facility to contain jurisdictional wetlands, and that continued operation of Redondo Beach will not impact those wetlands. However, a compliance date extension would delay land-use changes of the facility's site, such as a restoration of the site to open space and wetlands. The City of Redondo Beach, which administers a Local Coastal Program applicable to Redondo Beach, indicated in its July 16, 2021 comment letter to the State Water Board that AES' most recent Coastal Development Permit application was not deemed complete until October 2020, and that the proceeding is still in progress.

If the OTC compliance date extension is granted, neither AES, nor the current owner of the facility's property, are absolved from complying with existing state and local permits, laws, and regulations. Additionally, any litigation pertaining to the wetlands on Redondo Beach's property by any parties will proceed in an action separate from the amendment. This issue is outside the purview of the State Water Board's authority under CWA section 316(b). Further, the OTC Policy does not prevent the Coastal Commission or the City of Redondo Beach from administering the Coastal Act and associated Local Coastal Program pursuant to their authority. All related happenings are under the jurisdiction of the Coastal Commission and City of Redondo Beach and outside the scope of the amendment.

This amendment does not impede the State Water Board or the Coastal Commission from acting according to their individual responsibilities and legal requirements. The Coastal Commission will continue its role in ensuring that the facility is operated in compliance with all applicable laws and regulations.

5.5. Air Quality, Noise, and Aesthetic Impacts

Extending the compliance date of Redondo Beach will extend existing air, noise, and aesthetic impacts; however, impacts are expected to remain less than the baseline condition established in the 2010 Final SED.

Noise and aesthetic impacts related to compliance with the OTC Policy were determined to be less than significant in the 2010 Final SED.

The State Water Board found in the 2010 Final SED that it could not accurately assess air quality impacts related to compliance with the OTC Policy because it was difficult to estimate the method of compliance owners and operators would select for each power

plant. However, continued operation of Redondo Beach is not expected to result in air impacts greater than those reported as baseline air emissions in Section 2.6 of the 2010 Final SED.

In the 2010 Final SED, State Water Board staff compiled air emission data from 2006 for the active fossil-fueled OTC facilities using reported values obtained from the U.S. EPA Clean Air Markets database to establish baseline levels of pollutants, including CO_2 and methane. For individual pollutant outputs of Redondo Beach, please refer to the 2010 Final SED.

Baseline CO_2 emissions for Redondo Beach from 2006, 2018, and the updated emissions from 2019 are shown in Table 3. As seen in Table 3, there has been a significant reduction in CO_2 between the operating years of 2006 through 2019.

Table 3: 2006 vs. 2018 CO_2 Emissions

Facility	2006 CO_2 Emissions (tons/yr)	2018 CO_2 Emissions (tons/yr)	2019 CO_2 Emissions (tons/yr)
Redondo Beach	422,884	209,737	171,501

To date, most OTC owners and operators have elected to comply with the OTC Policy by retiring the OTC units. Some OTC sites have been repowered with new, more efficient combined-cycle gas turbines to replace retired capacity. Due to the combination of OTC unit retirements in a phased schedule and replacement of capacity with newer, more efficient resources that produce fewer emissions, as was investigated as a potential compliance scenario in the 2010 Final SED, implementation of the OTC Policy is expected to show a modest reduction of existing air quality impacts caused by operation of OTC units as compared to baseline conditions.

The State Water Board may consider air quality issues; however, the State Water Board is primarily responsible for implementing section 316(b) of the Clean Water Act. The State Water Board relies upon the agency representatives within the SACCWIS to inform recommendations on grid reliability and extensions of compliance dates for existing OTC facilities. The SACCWIS' recommendations were informed by a stack analysis conducted by the CPUC, the CAISO, and the CEC to alleviate forecasted shortfalls in energy supplies. Revisions to OTC Policy compliance dates based upon non-marine impacts to local communities, including air quality, may be considered but are largely beyond the scope of the State Water Board's authority under CWA section 316(b) and the OTC Policy.

Air Quality Regulations

There are air quality and environmental justice concerns regarding pollution from Redondo Beach into the air basin and the potential impacts this may have on human

health. All operating power plants producing emissions are permitted to run by local air quality management districts, which require scheduled monitoring and reporting from the operators to ensure compliance and public safety. Redondo Beach is located in the South Coast Air Quality Management District ("South Coast AQMD"). The Air Toxics Hot Spots Information and Assessment Act (see California Health and Safety Code Section 44360(b)(2)) requires facilities to do a health risk analysis every four years to determine whether citizens will be exposed to any harmful pollutants. Facilities additionally conduct toxic emissions evaluations as required by the South Coast AQMD. If there is a visible pollution event, there are guidelines and permit regulations in place to account for these emissions.

As Redondo Beach is expected to continue to be used like a peaker plant, air emissions are expected to be at or below recent levels, which are typically within permitted limits.

Based on information available to CARB, AES is currently in compliance with applicable CARB regulations as of July 2021, including ambient air quality standards and Title V of the federal Clean Air Act, which created an operating permits program implemented by the states.

In 2020, Redondo Beach had a total of 65 start-up events; Unit 5 had 21 start-ups, Unit 6 had 31 start-ups, and Unit 8 had 13 start-ups. Normally, unit start-up does not result in visible emissions, such as black smoke. However, mechanical failures have caused visible emissions during unit start-up or during operation generally one to two times a year. Generally, visible emissions resulting from nonoptimal operating conditions last between one and eight minutes. These situations typically result from an imbalance in the fuel-air mixture that feeds Redondo Beach's units, which may be caused by an electrical system or other minor equipment failure that affects the air induction system. South Coast AQMD has not indicated any reports of visible emissions from AES in 2021 thus far.

A recent incidence of visible emissions (black smoke) at Redondo Beach occurred on July 25, 2019, and was the result of the breakdown of a fan feeding oxygen to Unit No. 6. The breakdown was rectified, and the event stopped in eight minutes. The resulting investigation indicated that a fan was unexpectedly tripped on Unit 6, and the loss of oxygen caused the unit to emit dark, black smoke for approximately six minutes. The fan was manually reset, and the operation of the unit was temporarily reduced before it was brought to full load again. This visible emission event did not result in an NOV and Redondo Beach has not received any NOVs for excess emissions in the past 10 years. While no NOVs were issued, the facility received a Notice to Comply in August 2020, when a calibration of the ammonia flow meter was conducted after the due date.

While no breakdowns were reported during the 2020 compliance year, AES reported two Title V deviations at the Redondo Beach facility. Title V deviations occur when a

facility fails to comply with a term(s) in its permit, and they may or may not result in violations. The first deviation reported by AES occurred when the V-cone pressure transmitter on Device D23 failed and was stuck at full output from December 16, 2019, to March 21, 2020. This deviation is currently being evaluated by South Coast AQMD enforcement staff. The second deviation reported by AES occurred on July 31, 2020, when a fuel-to-air ratio imbalance resulted in Device D23 smoking intermittently for approximately 35 minutes. South Coast AQMD compliance staff did not observe the event and reports that it was unable to determine whether the event constituted a violation.

Another breakdown notification that reportedly involved visible emissions was made on June 4, 2021. South Coast AQMD staff reported that the breakdown was due to a failure of the forced draft fan that feeds oxygen into Unit 8. The issue was immediately resolved, and visible emissions (i.e. black smoke) lasted for approximately two minutes. South Coast AQMD compliance staff did not observe the event and reports that it was unable to determine whether the event constituted a violation.

The South Coast AQMD's Regional Clean Air Incentives Market program regulates air pollution within an enclosed "bubble" surrounding a facility and provides an economic incentive for each facility to meet their target for annual emission reductions of nitrogen oxides and sulfur oxides. As of April 2021, the South Coast AQMD's Compliance Year 2020 audit is in progress and any compliance issues, separate from other permits and local, regional, and state regulations, will be evaluated when the process is finalized.

As stated in the Final 2021 SACCWIS Report, South Coast AQMD plans to amend Rule 1135 in 2021 to remove the ammonia emission limits for electric generating units with catalytic control; add start-up, shutdown, and tuning provisions; and align the monitoring, reporting, and recordkeeping requirements to South Coast AQMD Rules 218 through 218.3, which establish requirements for the installation and operation of the continuous emission monitoring system. South Coast AQMD does not foresee any impacts to OTC power plant operations from this amendment and OTC electric generating units will continue to reference the ammonia limits and follow the start-up, shutdown, and tuning provisions required in their South Coast AQMD permits. For the continuous emission monitoring system requirements, OTC units will reference South Coast AQMD Rule 218 series which requires modest software modifications.

Greenhouse Gas Emissions

CARB has indicated that it is committed to meeting the state's climate change goals through the implementation of multiple complementary policies. In accordance with SB 350, CARB's 2017 Climate Change Scoping Plan sets a variety of actions to meet the 2030 greenhouse gas target of 40 percent below 1990 emission levels, including setting emission targets for the general electricity sector and specific targets for each

electricity provider. To meet these targets, large electivity providers are required to develop and submit integrated resource plans that detail how the utility will meet their customer's resource needs, reduce greenhouse gas emissions, and ramp up deployment of renewable and zero-carbon resources. CARB evaluates and revises these targets each integrated resource planning cycle to accommodate shifts in load-share between electricity providers and the formation of new entities.

Additionally, in 2013, the state implemented a Cap-and-Trade Program which places a firm, declining cap on primary sources of greenhouse gas emissions including large power plants, importers of electricity, and large industrial facilities. These businesses may comply by either reducing emissions or acquiring a limited number of tradable emissions allowances. In November 2020, CARB announced that all businesses covered by the Cap-and-Trade Program fully met their compliance obligations for covered 2019 greenhouse gas emissions. AES will continue to be responsible for ensuring it meets its Cap-and-Trade greenhouse gas emissions compliance obligations as well as its integrated resource planning greenhouse gas targets.

Air Quality and COVID-19

At the time of the adoption of the 2020 OTC Policy Amendment, there was concern that potential pollution from a facility like Redondo Beach could make individuals more susceptible to COVID-19 or worsen COVID-19 symptoms. CARB does not currently have any data explicitly linking emissions from power plants to instances of COVID-19 in California. However, CARB is ramping-up its research efforts to better understand associations between COVID-19, air quality, and health; staff are currently collecting data on changes in air quality, traffic counts, vehicle miles traveled, and freight activity since the COVID-19 stay-at-home orders commenced.

CARB is also funding two ongoing health studies, both approved by CARB's Research Screening Committee and the Board, to address the COVID-19 pandemic. One study is a California-specific version of the 2020 nationwide Harvard study released in April 2020, considering the role of air pollution in COVID-19 health outcomes. The expected completion date for this statewide study is within a 2-year timeframe. The second study uses data from Kaiser Permanente Southern California to study the linkage between air pollution and COVID-19 disease progression in Southern California residents. This study is also expected to be completed within a 2-year time frame.

5.6. Other Regulatory and Permitting Requirements

The NPDES permit and associated Time Schedule Order (TSO) issued to Redondo Beach by the Los Angeles Regional Water Board will expire on September 30, 2021, and December 31, 2021, respectively. Upon submission of a complete Report of Waste Discharge, the NPDES permit may be administratively extended until the adoption of a

new order; however, no additional time could be given to Redondo Beach to comply with certain final effluent limitations in this NPDES permit unless a revised TSO is adopted by the Los Angeles Regional Water Board. The Los Angeles Regional Water Board could develop a revised TSO for Redondo Beach concurrently with the OTC Policy amendment that is under consideration.

6. Analysis of Alternatives

This section presents alternatives of the amendment to the OTC Policy under consideration.

- **Alternative 1 – Preferred** – Amend the OTC Policy to extend the compliance date for Redondo Beach by two years from December 31, 2021, to December 31, 2023.
- **Alternative 2** – Amend the OTC Policy to extend the compliance date for Redondo Beach by one year from December 31, 2021, to December 31, 2022.
- **Alternative 3** – No action. Redondo Beach would stop using ocean water for once-through cooling on or before December 31, 2021. California may experience black-outs or brown-outs during times when electrical demand is high and imports are unreliable due to similar high demands in other states or balancing authority areas.

OTC Policy Amendment Preferred Alternative

The State Water Board is considering an amendment to the OTC Policy consistent with Alternative 1, to extend the compliance date for Redondo Beach for two years until December 31, 2023. The need to extend Redondo Beach to address system grid reliability concerns is supported by the SACCWIS recommendation, the information in the Final 2021 SACCWIS Report, and the information in this Staff Report.

7. Addendum to the 2010 Final SED

CEQA applies to a governmental action that could cause a significant effect on the environment, defined as “a substantial adverse change in the physical conditions which exist in the area affected by the proposed project.” (Cal. Pub. Resources Code § 21068; Cal. Code Regs., tit. 14, § 15002, subd. (b), (g).) The State Water Board adopted CEQA regulations at Title 23, California Code of Regulations, sections 3720-3782 to set forth rules and procedures that apply for environmental review of actions subject to the Board’s certified regulatory process. These regulations require the State Water Board to evaluate potential environmental impacts associated with adopting the OTC Policy. In 2010, the State Water Board certified a substitute environmental document in

accordance with these regulations, which at that time required a written report containing the following:

(1) a brief description of the proposed activity;

(2) reasonable alternatives to the proposed activity; and

(3) mitigation measures to minimize any significant adverse environmental impacts of the proposed activity.

(Title 23, California Code of Regulations, § 3777, subd. (a) (2010)

The State Water Board revised its CEQA regulations in 2011. The revisions provide more detail on the requirements for a substitute environmental document, which now must include the following:

(1) A brief description of the proposed project;

(2) An identification of any significant or potentially significant adverse environmental impacts of the proposed project;

(3) An analysis of reasonable alternatives to the project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts; and

(4) An environmental analysis of the reasonably foreseeable methods of compliance. The environmental analysis shall include, at a minimum, all of the following:

(A) An identification of the reasonably foreseeable methods of compliance with the project;

(B) An analysis of any reasonably foreseeable significant adverse environmental impacts associated with those methods of compliance;

(C) An analysis of reasonably foreseeable alternative methods of compliance that would have less significant adverse environmental impacts; and

(D) An analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable significant adverse environmental impacts of the reasonably foreseeable methods of compliance.

(Title 23, California Code of Regulations, § 3777, subd. (b). (eff. 2/18/11))

The State Water Board regulations governing CEQA compliance do not apply when the Board determines that the activity is not subject to CEQA. Title 23, California Code of Regulations, § 3720, subd. (b).

The State Water Board conducted a programmatic analysis to assess the potential for

adverse environment impacts that could be caused by requiring power plant owners to comply with the OTC Policy by employing one or more of the reasonably foreseeable compliance methods. To assess any potential effects, the State Water Board looked to the environmental setting, the physical conditions in the vicinity of the project as they existed at the time of the assessment. These physical conditions are often referred to as the "baseline" and are used to compare the existing physical environment with conditions that may result from approving the project. Tit. 14 Cal. Code Regs., Section 15125. The CEQA baseline is interpreted to include previously existing development and activities. (*Citizens for East Shore Parks v. State Lands Commission* (2011) 202 Cal.App.4th 549, 560.)

The 2010 Final SED for the OTC Policy describes and evaluates potential environmental impacts associated with installation of better technologies, closed-cycle wet cooling or equivalent, and potential mitigation measures for impacts associated with installation or use of those technologies. Because all OTC facilities affected by the OTC Policy were operating at the time of the 2010 Final SED, impacts associated with continued operation of those facilities were not analyzed as a potential impact associated with adoption of the OTC Policy or with reasonably foreseeable methods of compliance with the OTC Policy. Instead, impacts associated with operation of the affected power plants were considered as part of the environmental setting, or baseline against which to assess the effects of requiring compliance with the OTC Policy. Continued operation of the power plants did not constitute a substantial adverse change in the physical conditions existing at the time the OTC Policy was adopted.

The State Water Board included compliance schedules for each of the affected power plants and convened the SACCWIS to advise on energy needs affecting those compliance schedules. This was part of the original OTC Policy adoption, in order to prevent disruptions in electricity reliability as the OTC Policy was implemented. In planning the compliance schedule, the State Water Board was not required to evaluate the environmental effects of allowing plants to continue operation for differing numbers of years, since that operation was part of the baseline against which adoption of the OTC Policy was measured to determine its potential environmental effects.

The decision to extend specific compliance dates for purposes of grid reliability continues the baseline environmental setting that existed absent the OTC Policy. In addition, because the OTC Policy as adopted and as analyzed in the 2010 Final SED includes the potential for compliance date extensions, any new extension is a part of the project as originally analyzed. Extending a compliance date is not a new, independent action that requires CEQA analysis. Moreover, the proposal to extend the deadline for Redondo Beach does not constitute a project within the meaning of CEQA, because it continues the status quo and does not result in any direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment.

Nonetheless, the State Water Board prepared an addendum in order to provide new information regarding energy demand and operation of affected power plants. An addendum to a previously certified environmental impact report or equivalent such as a substitute environmental document is appropriate if some changes or additions are necessary but none of the conditions requiring preparation of a subsequent environmental document have occurred. (Tit. 23, Cal Code Regs., § 15164.) The conditions requiring preparation of a subsequent environmental document are those where the lead agency determines, on the basis of substantial evidence in light of the whole record, one or more of the following:

(1) Substantial changes are proposed in the project which will require major revisions of the previous [Environmental Impact Report (EIR)] or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:

(A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;

(B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;

(C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

(D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

(Title 14, Cal. Code of Regs., § 15162, subd. (a).)

These conditions have not been met. The compliance date extension is not a substantial change in the project, as compliance date extensions for grid reliability were part of the original project. There are no identified substantial changes with respect to the circumstances under which the project is undertaken that would involve new significant environmental effects resulting from compliance with the OTC Policy, as opposed to continued operation as per baseline conditions, nor are there significant effects of reasonably foreseeable methods of compliance with the OTC Policy that were not discussed previously or are shown to be substantially more severe than previously demonstrated. Finally, no new information has been identified that was not known at the time the 2010 Final SED was certified and that would show the compliance date extension to involve new significant effects or substantially more severe significant effects resulting from OTC Policy compliance or involve mitigation measures or alternatives previously found not feasible or different from those analyzed. Because these conditions have not been met, the preparation of a subsequent substitute environmental document is not necessary. Therefore, an addendum is appropriate, in order to reflect the changes or additions described below.

Section 5.1 above describes new developments concerning the need for continued operation of Redondo Beach to ensure grid reliability. This includes the CPUC proceedings, the root cause analysis, and the stack analysis reflecting potential shortfalls in 2022 and uncertainties in 2023 due to shifts in energy supply and demand. Section 5.2 of this Staff Report, including Figure 1 and 2, provides new information regarding projected ocean and estuarine water used for once-through cooling statewide. Daily average OTC water use on a statewide scale is projected to be at or below design flow rates from the original OTC Policy compliance schedule when the Policy was adopted in 2010.

OTC water use is associated with the amount of time a facility is actively operating. Air quality and noise impacts are also associated with active operation. Therefore, air quality and noise impacts on a statewide scale are projected to be at or below the impacts expected under the original OTC Policy compliance schedule.

Following is a summary of the major findings of the 2010 Final SED, together with further updated information and related regulatory developments.

7.1. Water Quality and Biological Resources

The 2010 Final SED concluded that less than significant (where the effect will not be significant and mitigation is not required) to no environmental impacts would result from implementation of the evaluated reasonably foreseeable methods of compliance with the OTC Policy. The State Water Board evaluated potential changes in effluent limitations in the case of installation of cooling towers to comply with the OTC Policy. While Redondo Beach was deemed ineligible for retrofit to a closed-cycle wet cooling

system because of its centralized location in the heart of Redondo Beach (which would inhibit the construction of wet cooling towers), Redondo Beach Unit 7 complied with the OTC Policy on September 30, 2019, and retired at approximately the same time. Redondo Beach Units 5, 6, and 8 continue to operate, but impacts are at or below the baseline established at the time of the adoption of the 2010 Final SED, as described above.

There were considered to be no water quality impacts from the OTC Policy associated with Redondo Beach at the time of the adoption of the 2010 Final SED. Additionally, complying with the OTC Policy was determined to result in no impacts to water quality beyond the established baseline at Redondo Beach.

Although the OTC Policy implementation does not result in impacts to water quality, the Los Angeles Regional Water Quality Control Board continues to develop regulatory requirements to address ongoing impairments within the receiving water. The State Water Board's California CWA section 303(d) list classifies Santa Monica Bay (Offshore and Nearshore, including Redondo Beach and King Harbor) as impaired. The pollutants of concern include: Dichlorodiphenyltrichloroethane, or DDT (tissue and sediment); Polychlorinated biphenyls, or PCBs (tissue and sediment); sediment toxicity, debris, and fish consumption advisory (due to DDT and PCBs). The inclusion of Santa Monica Bay on the 2012 CWA section 303(d) list documents the waterbody's lack of assimilative capacity for the pollutants of concern.

Thus, the U.S. EPA established the Santa Monica Bay Total Maximum Daily Loads (TMDL) for DDTs and PCBs on March 26, 2012. The TMDL includes waste load allocations for DDTs and PCBs for point sources, including Redondo Beach, which are equal to the Ocean Plan objectives for the protection of human health. The Los Angeles Regional Water Board developed water quality-based effluent limitations for DDTs and PCBs on the basis of the waste load allocations. The Los Angeles Regional Water Board developed water quality-based effluent limits pursuant to 40 C.F.R section 122.44(d)(1)(vii), which does not require or contemplate a reasonable potential analysis.

On June 9, 2016, the Los Angeles Regional Water Board adopted Order R4-2016-0222, which renewed the waste discharge requirements for Redondo Beach. Order R4-2016-0222 serves as a permit under the NPDES (NPDES No. CA0001201) Program and regulates the discharge of the pollutants at Redondo Beach. Prior to the adoption of Order R4-2016-0222, on January 20, 2016, AES submitted a written request to the Los Angeles Regional Water Board for additional time to achieve compliance with certain new effluent limitations contained in Order R4-2016-0222. Based on the monitoring data, the Regional Water Board found that interim effluent limitations were appropriate for temperature, pH, copper, and nickel. Thus, on June 9, 2016, the Regional Water Board adopted TSO R4-2016-0223 concurrently with the adoption of Order R4-2016-

0222. TSO R4-2016-0223 included interim effluent limitations for temperature, pH, copper, and nickel at the King Harbor Discharge Point (Discharge Point 002), which is considered an enclosed bay by the Los Angeles Regional Water Board. On August 24, 2017, AES submitted a written request for additional time to achieve compliance with the new effluent limitations contained in Order R4-2016-0222. Based on the monitoring data, the Regional Water Board found that interim effluent limitations were appropriate for DDT at the Pacific Ocean (Discharge Point 001) and Discharge Point 002. On November 30, 2017, the Executive Officer issued TSO R4-2016-0223-A01 that amended TSO R4-2016-0223 to include interim limitations for DDT at Discharge Points 001 and 002.

In 2018 and 2020, TSO R4-2016-0223-A01 was amended to modify compliance deadlines due to the associated OTC Policy compliance date extension of Redondo Beach to support grid reliability. At present, the TSO requires AES to comply with final effluent limitations for DDT, temperature, pH, copper, and nickel by December 31, 2021. The Los Angeles Regional Water Board could develop a revised TSO for Redondo Beach concurrently with the OTC Policy amendment.

Further, AES intends to retire all OTC units at Redondo Beach by the compliance dates adopted by the State Water Board, which will significantly reduce OTC-related impacts to marine life and water quality from the baseline conditions established in the 2010 Final SED.

7.2. Utilities and Service Systems

Impacts to the electrical grid due to implementation of the OTC Policy were considered to be less than significant with mitigation. Disruptions to utility services and grid reliability would be most effectively mitigated by establishing a statewide policy that included provisions to consult with the state's energy agencies and coordinate implementation among the Regional Water Boards. The SACCWIS monitors statewide grid reliability to identify potential electrical shortages potentially brought about by implementation of the OTC Policy. Due to the potential for projected electrical shortfalls in 2022 and uncertainty in 2023, the SACCWIS, in its March 26, 2021 SACCWIS Report, recommended the State Water Board consider extending the compliance date for Redondo Beach Units 5, 6, and 8 for two additional years until December 31, 2023.

7.3. Air Quality

The State Water Board evaluated potential impacts to air quality in three scenarios assuming that all OTC units deemed feasible are retrofitted to either closed-cycle wet cooling or closed-cycle dry cooling systems and new combined-cycle generation or increased capacity at retrofitted OTC units replaces the nuclear OTC units at Diablo Canyon Nuclear Power Plant and San Onofre Nuclear Generating Station. It was

determined that air quality impacts related to complying with the OTC Policy could not accurately be assessed because it was difficult to estimate the method of compliance owners and operators would select for each power plant. The 2010 Final SED concluded that complying with the OTC Policy with a combination of OTC unit retirements and replacement of capacity with newer, more efficient resources that produce fewer emissions would be expected to show no change to a modest reduction of existing baseline air quality impacts caused by operation of OTC units.

7.4. Aesthetics and Noise

Noise and aesthetic impacts related to compliance with the OTC Policy were determined to be less than significant in the 2010 Final SED. If cooling towers were installed as a method of compliance with the OTC Policy, appropriate mitigation would be required to offset aesthetic and noise impacts.

This amendment would not affect the identified reasonably foreseeable methods of compliance with the OTC Policy, nor would it result in any new significant environmental impacts or a substantial increase in the severity of previously identified significant effects beyond what was identified in the 2010 Final SED, as illustrated by the above discussion. Therefore, continued operation of Redondo Beach under its current operational configuration does not constitute a change in the physical environment relative to the baseline identified in the 2010 Final SED and does not require subsequent or supplemental environmental analysis.

8. Water Code Section 13140 and Other Required Considerations

8.1. Economic Analysis

The 2010 Final SED provides information on the costs of compliance with the OTC Policy. An extension of the compliance date for Redondo Beach is anticipated to result in some cost to the owner and operator for maintaining trained staff and resources to continue operations and interim mitigation payments through December 31, 2023. These costs are considered as cost of compliance with the OTC Policy and are consistent with those discussed in the 2010 Final SED.

8.2. The Human Right to Water

Once-through cooling water use is not included in Resolution No. 2016-0010, which adopted the human right to water as a core value of the State and Regional Water Boards. The primary goal of the OTC Policy to is protect marine life from the harmful impacts of impingement and entrainment associated with the use of cooling water intake structures. Therefore, the directives of Resolution No. 2016-0020 are not applicable to this amendment to the OTC Policy that is under consideration.

9. References

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Enclosure 5

Statewide Advisory Committee on Cooling Water Intake Structures

Final Recommended Compliance Date Extensions for Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach Generating Stations

January 23, 2020

CALIFORNIA Water Boards
STATE WATER RESOURCES CONTROL BOARD
REGIONAL WATER QUALITY CONTROL BOARDS

CALIFORNIA STATE LANDS COMMISSION

CALIFORNIA COASTAL COMMISSION

PUBLIC UTILITIES COMMISSION · EUREKA · STATE OF CALIFORNIA

CALIFORNIA AIR RESOURCES BOARD

California ISO

CALIFORNIA ENERGY COMMISSION

Table of Contents

Acronyms and Abbreviations

Acronym or Abbreviation	Full Name or Phrase
Air District	Air Quality Management District
Alamitos	Alamitos Generating Station
BARCT	Best available retrofit control technology
CAISO	California Independent System Operator
CEC	California Energy Commission
CPUC	California Public Utilities Commission
Huntington Beach	Huntington Beach Generating Station
IRP	Integrated Resource Planning
Los Angeles Regional Water Board	Los Angeles Regional Water Quality Control Board
MW	Megawatt
NPDES	National Pollutant Discharge Elimination System
Ormond	Ormond Beach Generating Station
OTC	Once-through cooling
OTC Policy	Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling
Redondo Beach	Redondo Beach Generating Station
SACCWIS	Statewide Advisory Committee on Cooling Water Intake Structures
Santa Ana Regional Water Board	Santa Ana Regional Water Quality Control Board
South Coast AQMD	South Coast Air Quality Management District
State Water Board	State Water Resources Control Board

TSO	Time Schedule Order
U.S. EPA	United States Environmental Protection Agency
Ventura County APCD	Ventura County Air Pollution Control District

1. Executive Summary

The Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling[1] (Once-Through Cooling or OTC Policy) requires owners or operators of existing power plants that use ocean or estuarine water for once-through cooling to select one of two compliance alternatives in Section 2.A to minimize entrainment and impingement of fish, larvae, and other aquatic life. The OTC Policy includes compliance dates for the nineteen coastal and estuarine power plants existing when the OTC Policy became effective on October 1, 2010. Of these nineteen plants, nine are still operating and are scheduled to comply by specific compliance dates within the next decade, as presented in Table 1 of the OTC Policy.

The joint-agency Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS) was created to advise the State Water Resources Control Board (State Water Board) on the implementation of the OTC Policy, ensuring the compliance schedule takes into account the reliability of California's electricity supply, including local area reliability, statewide grid reliability, and permitting constraints. The SACCWIS includes representatives from the California Energy Commission (CEC), California Public Utilities Commission (CPUC), California Coastal Commission, California State Lands Commission, California Air Resources Board, the California Independent System Operator (CAISO), and the State Water Board.

This report provides OTC Policy compliance schedule extension recommendations related to system-wide grid reliability issues projected to arise starting in summer of 2021 should four OTC power plants shut down by December 31, 2020, as currently required by the OTC Policy. These recommendations come as a continuation of the Local and System-Wide 2021 Grid Reliability Studies Report approved by SACCWIS on August 23, 2019, and hereinafter known as the August 23, 2019 SACCWIS Report.

The August 23, 2019 SACCWIS Report recommended the State Water Board consider extending the OTC Policy compliance date for Alamitos Units 3, 4, and 5 for two or more years to support local and system-wide grid reliability concerns, and some portion of the 2,579 megawatts (MW) available from Huntington Beach, Redondo Beach, and Ormond Beach generating stations to support system-wide grid reliability concerns.

This report includes analysis conducted following the August 23, 2019 SACCWIS Report that considers air and water permitting requirements, capabilities of the existing OTC resources, including the potential to meet multiple resource adequacy needs or to provide various electrical services to the CAISO. The report also includes further analysis and stakeholder input in the CPUC Integrated Resource Planning (IRP) proceeding, and other relevant information.

On November 7, 2019, Decision (D.)19-11-016 was approved by commissioners of the CPUC, completing the IRP process for R.16-02-007. D.19-11-016 directs 3,300 MW of new procurement from load serving entities under the CPUC's jurisdiction to ensure

system-wide electric reliability. The decision also recommends that the State Water Board consider revising the OTC Policy to extend the compliance dates for Alamitos Units 3, 4, and 5 for up to three years, Huntington Beach Unit 2 for up to three years, Redondo Beach Units 5, 6, and 8 for up to two years, and Ormond Beach Units 1 and 2 for up to one year.

Based on review of additional information following the August 23, 2019 SACCWIS meeting, SACCWIS recommends the State Water Board extend the OTC Policy compliance dates of Alamitos Units 3, 4, and 5 for three years through December 31, 2023, Huntington Beach Unit 2 for three years through December 31, 2023, Ormond Beach Units 1 and 2 for three years through December 31, 2023, and Redondo Beach Units 5, 6, and 8 for one year through December 31, 2021.

2. Background

In the August 23, 2019 SACCWIS Report, SACCWIS recommended the State Water Board extend the compliance dates for Alamitos Generating Station (Alamitos) Units 3, 4, and 5 (1,163 MW) to ensure local grid reliability. SACCWIS further recommended the State Water Board consider extending the compliance dates for some portion of the 2,579 MW of capacity generated by Huntington Beach Generating Station (Huntington Beach) Unit 2 (215 MW), Ormond Beach Generating Station (Ormond Beach) Units 1 and 2 (1,516 MW), and Redondo Beach Generating Station (Redondo Beach) Units 5, 6, and 8 (848 MW) to ensure system-wide grid reliability. On November 19, 2019, the SACCWIS presented an information item to the State Water Board on the findings of the August 23, 2019 SACCWIS Report. The SACCWIS planned to conduct further analyses, review information, and await the conclusion of the CPUC IRP proceeding before formulating a recommendation on extensions of OTC Policy compliance dates for the latter three generating stations.

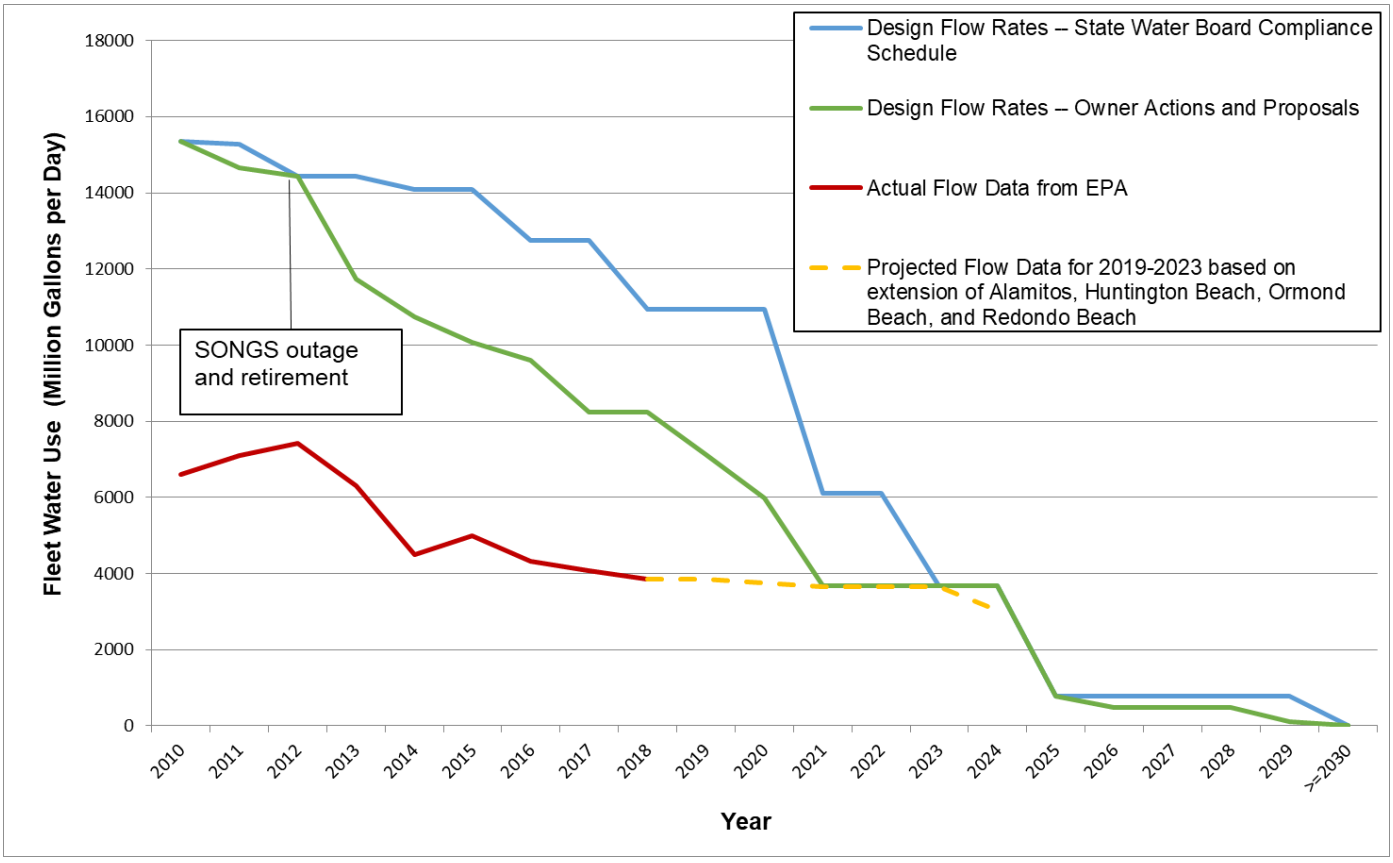
The system-wide grid reliability concerns stem from several sources, including shifts in peak demand to later in the day and later in the year when solar and wind resources are not as reliably available to meet peak demand; related changes in the calculation of available capacity from wind and solar resources to be less than previously determined; a significant increase in projected reliance on imports over historical levels; and earlier-than-expected retirements of some non-OTC generators. Additional power is likely needed for summer peak usage on hot days.

In the event of extension of the OTC Policy compliance dates for Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach generating stations, the four power plants would primarily be used as peaker plants that operate during high energy use times. The power plants are expected to run at or below their current operating capacity, which in 2018 was on average 5%.

Impacts from entrainment and impingement of marine life are expected to remain at or below the current level. If the compliance dates for OTC power plants are extended, the owners and operators will be required to continue fulfilling interim mitigation requirements for the duration of the extension or until the OTC power plants retire, whichever comes first. Interim mitigation requirements consist of making annual interim mitigation payments to the Ocean Protection Council and State Coastal Conservancy.

In Figure 1, the dashed yellow line represents projected OTC power plant fleet water usage in millions of gallons per day if Alamitos, Huntington Beach, Redondo Beach, and Ormond Beach operate for an additional three years through December 31, 2023. Projected flow rates for the four power plants were calculated from 2018 annual flow rates. As shown in the figure, the projected fleet water usage would still be below design flow rates from the original OTC Policy compliance schedule. Note, for the purposes of this figure, Moss Landing Power Plant has "zero" water usage after its December 31, 2020 Track 2 compliance date.

Figure 1: Historic and Projected Fleet Ocean Water Flow Rates



3. System-Wide Grid Reliability Concerns and Assessment

On June 20, 2019, the Assigned Commissioner and Administrative Law Judge in the CPUC IRP proceeding (R.16-02-007) issued a ruling that identified a potential system capacity shortfall of between 2,300 and 4,400 MW in the CAISO Balancing Authority Area beginning in the summer of 2021.[2] The ruling asked interested parties to comment on the analysis leading to the determination of a potential capacity shortfall and to propose solutions to address a shortfall. The analysis found that the shortfall arises from several factors, including shifts in peak electric demand to later in the year and later in the day, which reduces the ability of solar generation to meet peak capacity requirements; changes in the method for calculating the qualifying capacity of wind and solar resources resulting in lower qualifying capacity for these resources than previously determined; uncertainty regarding the level of imports on which California can depend in the future as other states also shift towards using more renewable energy resources; and some unanticipated non-OTC generator retirements[3].

In November 2019 after receiving comments, the CPUC issued D.19-11-016. In the decision, the CPUC subsequently directed 3,300 MW of new capacity procurement by 2023, with 50% of this procurement due to come online by August 1, 2021, 75% by August 1, 2022, and 100% by August 1, 2023 to address the system capacity shortfall.[4] The decision limits the amount of new natural gas that could be used to meet the procurement requirements. The decision also recommended phased extensions to the OTC Policy compliance dates for specific generating units to support the procurement schedule: an extension of Alamitos Units 3, 4, and 5 for up to three years, an extension of Huntington Beach Unit 2 for up to three years, an extension of Redondo Beach Units 5, 6, and 8 for up to two years, and an extension of Ormond Beach Units 1 and 2 for up to one year (Decision D.19-11-016, Ordering Paragraph 1). These OTC Policy compliance date extensions would provide a “bridge” of roughly 3,740 MW in 2021, roughly 2,230 MW in 2022, and roughly 1,380 MW in 2023 as the 3,300 MW of new procurement comes online by 2023.

4. Regulatory Requirements

4.1. Water Quality

In the event of a compliance date extension for an OTC power plant, the OTC Policy would have to be amended by the State Water Board to reflect the new compliance date.

In the event of a compliance date extension for Alamitos, three regulatory documents from the Los Angeles Regional Water Quality Control Board (Los Angeles Regional Water Board) would have to be amended.

In the event of an OTC Policy compliance date extension for Huntington Beach, Ormond Beach, and Redondo Beach generating stations, associated National

Pollution Discharge Elimination System (NPDES) permits will need to be amended. In the case of Redondo Beach, a Time Scheduled Order (TSO) would also need to be amended. Of the four generating stations recommended for an OTC Policy compliance date extension, Alamitos, Redondo Beach, and Ormond Beach are within the Los Angeles Regional Water Board's jurisdiction. Huntington Beach is within the Santa Ana Regional Water Quality Control Board's (Santa Ana Regional Water Board) jurisdiction.

At this time, the State Water Board and the Los Angeles and Santa Ana Regional Water Boards intend to consider amendments to the OTC Policy and associated regional board regulatory documents for all four power plants, with associated staff development of the amendments happening concurrently. The State Water Board intends to consider amending the compliance dates in the OTC Policy for Alamitos, Huntington Beach, Redondo Beach, and Ormond Beach before December 31, 2020. Concurrently, the Los Angeles Regional Water Board intends to consider reopening and amending the TSO, NPDES permit, and San Gabriel River Metals Total Maximum Daily Load for Alamitos, the TSO and NPDES permit for Redondo Beach, and the NPDES permit for Ormond Beach. Additionally, the Santa Ana Regional Water Board may need to consider reopening and amending the NPDES permit for Huntington Beach.

4.2. Air Quality

In California, a new or modified stationary source that will emit air pollutants typically must meet emission control requirements and obtain preconstruction and operating permits for its equipment from the local air pollution control or air quality management district (air district) where the source is located. The air district prepares an engineering analysis and places conditions in the permits to ensure the source will comply with the requirements of federal, state, and local air pollution regulations. For large power plants also subject to the CEC licensing process, the air district's engineering analysis and proposed conditions for the preconstruction permit are submitted to the CEC as a Determination of Compliance. However, the air district also maintains and enforces the power plant's operating permits. Title V is a federal program designed to standardize operating permits for major sources of emissions, and the air districts have adopted rules to implement the Title V permit program.

Air permitting requirements for Alamitos were discussed in detail in the August 23, 2019 SACCWIS Report and are unchanged. Huntington Beach and Redondo Beach power plants are under the permitting jurisdiction of the South Coast Air Quality Management District (South Coast AQMD); Ormond Beach is under the jurisdiction of the Ventura County Air Pollution Control District (Ventura County APCD). All three power plants are major sources subject to air district preconstruction, operating, and Title V permit requirements.

The South Coast AQMD is currently in the process of transitioning away from its RECLAIM program to source-specific command-and-control rules. As a result, the South Coast AQMD is updating its rules to reflect current best available retrofit control technology (BARCT) requirements. Rule 1135 for power generating facilities was updated on November 2, 2018. The rule exempts OTC units from the BARCT emission standards as long as the units operate in compliance with existing permit conditions, meet the compliance dates specified in the OTC Policy, and notify the South Coast AQMD of any OTC Policy compliance date extensions within three months of approval by the State Water Board.

The Title V permit for the Huntington Beach Unit 2 utility boiler currently reflects plans from the preconstruction permitting action finalized in 2017 to shut down and replace Unit 2 with new simple-cycle gas turbines (Phase 2). These permit conditions specify shutdown of Unit 2 by December 31, 2020. Any extension of the OTC Policy compliance date for Unit 2 cannot go beyond the start of operation of the simple-cycle gas turbines, which is currently identified as third quarter 2023. In the event of an OTC Policy compliance date extension for Unit 2, AES, the owner and operator of Huntington Beach, would need to submit an application to South Coast AQMD to modify the permit to reflect the updated boiler shutdown date in relation to startup of the new gas turbines and ensure compliance with applicable rules and regulations. In addition, AES would need to modify the retirement plan for the permanent shutdown of boiler Unit 2 that was submitted to South Coast AQMD. Modification of the Title V permit will require coordination with United States Environmental Protection Agency (U.S. EPA) Region 9 and may require a public notice. Amending the Title V permit typically requires six months to one year to complete, depending on the nature of the modification.

Redondo Beach Units 5, 6, and 8 are not connected with any permitted utility boiler replacement projects. Boiler replacement project applications submitted to CEC and South Coast AQMD several years back have since been either suspended or cancelled. As a result, these generating units can operate beyond 2020, as long as they continue to comply with Rule 1135 and the conditions of their existing Title V permit.

The Ventura County APCD submitted a Title V permit renewal for Ormond Beach to U.S. EPA Region 9 earlier this year. The comment period closed on August 19, 2019, and U.S. EPA had no comments on the renewal. The reissuance of the renewed Title V permit occurred on December 10, 2019, with an updated permit term of October 16, 2019, to December 31, 2023. There are no OTC Policy compliance date conditions in the permit. Therefore, no air permit modifications are required to extend operation of Ormond Beach beyond 2020, as long as the facility continues to operate in compliance with its permit conditions.

5. Alternatives

5.1. Alternative 1 – No Action

In this alternative, SACCWIS would recommend no change to the OTC Policy compliance dates. The four generating stations would stop using ocean water for once-through cooling on or before December 31, 2020. California may experience black-outs or brown-outs during times when electrical demand is high and imports are unreliable due to similar high demands in other states or balancing authority areas.

5.2. Alternative 2 – Extend OTC Compliance Dates for All Power Plants for Three Years

In this alternative, SACCWIS would recommend the State Water Board extend the OTC Policy compliance dates for all available generating units – Alamitos Units 3, 4, and 5 (1,163 MW), Huntington Beach Unit 2 (215 MW), Redondo Beach Units 5, 6, and 8 (848 MW), and Ormond Beach Units 1 and 2 (1,516 MW) – for three years, until December 31, 2023.

This would maximize (at roughly 3,740 MW) the existing OTC capacity available to meet reliability needs as 3,300 MW of new capacity comes online pursuant to D.19-11-016. This would also maximize the buffer of available capacity if there are delays in new procurement, at least through the end of 2023.

As discussed in D.19-11-016, some stakeholders have argued that Ormond Beach and Redondo Beach in particular have harmful impacts on local communities and extensions of these power plants may interfere with existing plans for redevelopment of the associated properties (see D.19-11-016, page 20).

5.3. Alternative 3 – Extend OTC Compliance Dates for All Power Plants with Phased Compliance Dates

In this alternative, SACCWIS would recommend the State Water Board extend the OTC compliance dates for all available generating units in a phased approach. Specifically, SACCWIS would recommend an extension of Alamitos Units 3, 4, and 5 for three years until December 31, 2023, an extension of Huntington Beach Unit 2 for three years until December 31, 2023, an extension of Redondo Beach Units 5, 6, and 8 for two years until December 31, 2022, and an extension of Ormond Beach Units 1 and 2 for one year until December 31, 2021.

Concluding each extension on December 31st would ensure the availability of capacity for contracting during the peak summer months and could simplify contracting efforts by aligning with resource adequacy requirements and procurement timelines. This alternative would provide a “bridge” of roughly 3,740 MW in 2021, roughly 2,230 MW in 2022, and roughly 1,380 MW in 2023 as the 3,300 MW of new procurement comes online by 2023.

This alternative is recommended by the CPUC in D.19-11-016 and is intended to minimize the harmful impacts on local communities near Ormond Beach and Redondo Beach expressed by stakeholders.

The SACCWIS recognizes that Alternative 3 would also address system-wide grid reliability needs.

5.4. Alternative 4 – Extend OTC Compliance Dates for All Power Plants with Phased Compliance Dates Modified from Alternative 3

In this alternative, SACCWIS would recommend that the State Water Board extend the OTC compliance dates for all available generating units in a phased approach with different compliance dates for different facilities than Alternative 3. Specifically, SACCWIS would recommend an extension of Alamitos Units 3, 4, and 5 for three years until December 31, 2023, an extension of Huntington Beach Unit 2 for three years until December 31, 2023, an extension of Ormond Beach Units 1 and 2 for three years until December 31, 2023, and an extension of Redondo Beach Units 5, 6, and 8 for one year until December 31, 2021.

This alternative would be responsive to comments from the city mayors of Redondo Beach and Hermosa Beach to the State Water Board on November 19, 2019. Both cities expressed opposition to an extension of Redondo Beach's OTC Policy compliance date. Extending Redondo Beach for one year would ensure the availability of that capacity for contracting during 2021. The State Water Board received a comment from the Oxnard City Manager on November 18, 2019, noting his support for an extension of Ormond Beach Units 1 and 2 if the City Council and GenOn agree on a plan to perform comprehensive decommissioning, dismantling, and remediation of the site, and asking for additional time to negotiate such a plan.

6. Conclusions and Recommendations

Based on the additional information and recommendations provided in CPUC Decision D.19-11-016, SACCWIS recommends that the State Water Board consider Alternative 4, extending the OTC Policy compliance dates of Alamitos Units 3, 4, and 5 for three years (through December 31, 2023), Huntington Beach Unit 2 for three years (through December 31, 2023), Ormond Beach Units 1 and 2 for three years (through December 31, 2023), and Redondo Beach Units 5, 6, and 8 for one year (through December 31, 2021). This alternative would be responsive to supporting system-wide grid reliability concerns starting in summer 2021, address community requests, and provide a necessary "bridge" as new procurement comes online to lessen reliability on imported energy.

End Notes

[1] The 2017 Once-Through Cooling Policy. (https://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/policy.shtml#amendments)

[2] See "Assigned Commissioner and Administrative Law Judge's Ruling Initiating Procurement Track and Seeking Comment on Potential Reliability Issues," June 20, 2019. (http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M302/K942/302942332.PDF)

[3] SACCWIS information item presentation to the State Water Board, November 19, 2019 Board meeting, Agenda Item 6.

[4] Decision D.19-11-016, Conclusion of Law 27 and Ordering Paragraph 3, November 7, 2019. (http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M319/K825/319825388.PDF)

Enclosure 6

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 2020-0029

AMENDMENT TO THE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING TO REVISE COMPLIANCE SCHEDULES FOR ALAMITOS, HUNTINGTON BEACH, ORMOND BEACH, AND REDONDO BEACH GENERATING STATIONS AND DIABLO CANYON NUCLEAR POWER PLANT

WHEREAS:

1. The State Water Resources Control Board ("State Water Board") is designated as the state water pollution control agency for all purposes stated in the Clean Water Act, including water quality control planning and waste discharge regulation.

2. The State Water Board is responsible for adopting state policy for water quality control, which may consist of water quality principles, guidelines, and objectives deemed essential for water quality control.

3. On May 4, 2010, the State Water Board adopted the statewide "Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling" ("Once-Through Cooling" or "OTC Policy") under Resolution No. 2010-0020. The Office of Administrative Law approved the OTC Policy on September 27, 2010, and the OTC Policy became effective on October 1, 2010.

4. The OTC Policy establishes uniform, technology-based standards to implement Clean Water Act section 316(b), which requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts.

5. The OTC Policy applies to nine existing power plants located along the California coast, and is implemented through National Pollutant Discharge Elimination System ("NPDES") permits, issued pursuant to Clean Water Act section 402, which authorize the point source discharge of pollutants to navigable waters. The OTC Policy originally affected nineteen once-through cooling power plants, and ten of those facilities have ceased all once-through cooling operations since adoption of the OTC Policy.

6. The OTC Policy establishes a schedule that provides the latest compliance date for the replacement, repowering, or retirement of each remaining power plant still utilizing once-through cooling operations while accounting for potential impacts to California's electrical supply.

7. The OTC Policy was amended on July 19, 2011, making changes to compliance dates for power generating stations owned and operated by the Los Angeles Department of Water and Power ("LADWP") on a unit-by-unit basis rather than a facility-wide basis. The OTC Policy was amended on June 18, 2013, authorizing the

Regional Water Quality Control Boards to issue NPDES permits to point source dischargers in California, including power plants subject to the OTC Policy. The OTC Policy was amended on April 7, 2015, to extend the compliance date for the Moss Landing Power Plant from December 31, 2017, to December 31, 2020. The OTC Policy was last amended on August 15, 2017, to extend the compliance date for Encina Power Station from December 31, 2017, to December 31, 2018.

8. Section 3.A of the OTC Policy requires the owner or operator of an affected fossil-fuel power plant to submit an implementation plan to the State Water Board by April 1, 2011, selecting one of two OTC Policy compliance tracks and describing the general design, construction, or operational measures to implement the compliance track. The State Water Board received implementation plans from all owners and/or operators as requested, including the implementation plans for AES-Southland, Inc. ("AES") Alamitos Generating Station ("Alamitos"), AES Huntington Beach Generating Station ("Huntington Beach"), and AES Redondo Beach Generating Station ("Redondo Beach") and the GenOn Energy, Inc. ("GenOn") Ormond Beach Generating Station ("Ormond Beach"). Both AES and GenOn plan to comply with the OTC Policy through ceasing once-through cooling operations at the facilities listed above by the compliance dates.

9. The Statewide Advisory Committee on Cooling Water Intake Structures ("SACCWIS") is composed of representatives from the California Air Resources Board, the California Coastal Commission, the California Energy Commission, the California Public Utilities Commission ("CPUC"), the California State Lands Commission, the California Independent System Operator ("CAISO"), and the State Water Board. The purpose of the committee is to review implementation plans and schedules and to advise the State Water Board on OTC Policy implementation, in order to ensure that the implementation schedule takes into account local area and grid reliability, including permitting constraints.

Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach Generating Stations

10. On June 20, 2019, the Assigned Commissioner and Administrative Law Judge in the CPUC Integrated Resource Planning proceeding ("Rulemaking R.16-02-007") (https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M302/K942/302942332.PDF) issued a ruling that identified a potential system capacity shortfall of between 2,300 and 4,400 MW in the CAISO Balancing Authority Area beginning in the summer of 2021. The analysis found that the potential shortfall arises from several factors, including shifts in peak demand to later in the day (shifting from 4 p.m. - 6 p.m. to 7 p.m. - 9 p.m.) and later in the year (shifting from August to September) when solar and wind resources are not as reliably available to meet peak demand; changes in the method for calculating the qualifying capacity of wind and solar resources resulting in lower qualifying capacity for these resources than previously determined; uncertainty regarding the level of imports on which California can depend in the future as other states also shift towards using more renewable energy resources; and unanticipated retirements of five non-OTC generating units.

11. On August 23, 2019, the SACCWIS approved the *Local and System-Wide 2021 Grid Reliability Studies* report, which assessed electric system reliability under study assumptions and scenarios. The analyses showed that it is necessary for Alamitos Units 3, 4, and 5 to be operational for two or more years to ensure local grid reliability, and for a portion of the available OTC units at Huntington Beach, Ormond Beach, and Redondo Beach to be operational for two or more years, but no longer than necessary, to address system-wide grid reliability concerns. The SACCWIS concluded that further information and analysis is needed before the committee could form a final recommendation on compliance date extensions for State Water Board consideration.

12. On November 7, 2019, the CPUC adopted Decision ("D.")19-11-016 (https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M319/K825/319825388.PDF). In the decision, the CPUC directed 3,300 MW of new capacity to be procured by 2023, with 50% (1,650 MW) of this procurement targeted to come online by August 1, 2021; 75% (an additional 825 MW) by August 1, 2022; and 100% (an additional 825 MW) by August 1, 2023, to address the system-wide capacity shortfall. The decision also recommended the following phased extensions to the OTC Policy compliance dates for specific generating units to support the procurement schedule:

    a. Extend the compliance date of Alamitos Units 3, 4, and 5 for up to three years to December 31, 2023;

    b. Extend the compliance date of Huntington Beach Unit 2 for up to three years to December 31, 2023;

    c. Extend the compliance date of Ormond Beach Units 1 and 2 for up to one year to December 31, 2021; and

    d. Extend the compliance date of Redondo Beach Units 5, 6, and 8 for up to two years to December 31, 2022.

    These compliance date extensions would provide a "bridge" of roughly 3,740 MW in 2021, roughly 2,230 MW in 2022, and roughly 1,380 MW in 2023 as the 3,300 MW of new procurement comes online by 2023.

13. On January 23, 2020, the SACCWIS met and considered additional information and documents. The SACCWIS approved the *Recommended Compliance Date Extensions for Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach Generating Stations* report and acknowledged that the CPUC's D.19-11-016, as Alternative 3, is sufficient to maintain grid reliability.

14. Also on January 23, 2020, the SACCWIS recommended, as Alternative 4, the State Water Board consider the following compliance date extensions in order to ensure local and system-wide grid reliability as new procurement directed by the CPUC comes online over the next three years to offset the potential energy shortfall:

a. Extend the compliance date of Alamitos Units 3, 4, and 5 for three years to December 31, 2023;

b. Extend the compliance date of Huntington Beach Unit 2 for three years to December 31, 2023;

c. Extend the compliance date of Ormond Beach Units 1 and 2 for three years to December 31, 2023; and

d. Extend the compliance date of Redondo Beach Units 5, 6, and 8 for one year to December 31, 2021.

15. The amendment to the OTC Policy extends the compliance dates for Alamitos Units 3, 4, and 5, Huntington Beach Unit 2, Ormond Beach Units 1 and 2, and Redondo Beach Units 5, 6, and 8 as recommended by the SACCWIS and as reflected in Attachment A. The amendment will be made to the implementation schedule as new lines for Milestones 30 and 34 of Table 1 in Section 3.E.

16. AES and GenOn, or future owners and operators of Alamitos, Huntington Beach, Redondo Beach, and Ormond Beach, will be required to continue complying with interim mitigation requirements up to and until final compliance with the OTC Policy.

17. The State Water Board adopted the OTC Policy with the explicit purpose of minimizing adverse environmental impacts to marine life resulting from use of coastal and estuarine waters for power plant cooling, and the State Water Board remains committed to timely compliance with the OTC Policy by owners and operators of affected power plants. Further, the State Water Board recognizes that OTC Policy compliance dates provide certainty to communities in planning for future land use.

In adopting the OTC Policy, the State Water Board recognized that power generating facilities are part of a state-wide electrical grid and that changes in generating capacity resulting from OTC Policy compliance may have an impact on the grid and power availability, requiring long-term planning for transmission, generation, and demand resources. The OTC Policy provided a lengthy compliance schedule based upon extensive consultation with the energy agencies in order to facilitate planning for potential replacement, repowering, or retirement of affected power plants while avoiding disruption in the state's electrical supply. The OTC Policy requires compliance as soon as possible, but no later than the dates set forth in the Policy Implementation Schedule (Policy Section 2.B.(1)), providing for State Water Board consideration of suspensions or revisions of compliance dates recommended by the energy agencies "based upon the need for continued operation of an existing power plant to maintain the reliability of the electrical system . . . ." (OTC Policy section 2.B.(2).) Provisions for NPDES permits implementing the OTC Policy further emphasize that compliance schedule revisions recommended by the SACCWIS are those "necessary to maintain reliability of the electric system." (OTC Policy section 3.C.(1).) The OTC Policy also directs that, where the energy

agencies make a unanimous recommendation for compliance date revisions based on grid reliability, the State Water Board "shall afford significant weight to the recommendation." (OTC Policy section 3.B(5).)

18. The CPUC, CAISO, and CEC, in a joint submission to the State Water Board on May 27, 2020, affirmed the continued need for the extensions specified above. In August 2020, the CPUC, CAISO, and CEC updated the State Water Board on the progress of bringing new resources online to replace the affected facilities. The CPUC has established a process to track the procurement and development of the new projects fulfilling the 3,300 MW ordered by the CPUC in D.19-11-016. Currently, the process suggests that most projects needing to be developed by August 1, 2021, are meeting their development milestones. However, potential impacts from the coronavirus disease 2019 ("COVID-19"), shelter-at-home, and social distancing requirements may create new delay risks. Potential delays may also result from COVID-19-related supply chain issues and/or potential permitting or inspection delays resulting from agency staff, budget, or procedural constraints related to COVID-19.

19. The CPUC is continuing to monitor development of the new 1,650 MW of new resources targeted to come online by August 1, 2021, as set forth in Finding 12. However, if the CPUC's tracking of project development indicates a significant risk of delay in project online dates that would put California's electricity reliability at risk, the CPUC, CAISO, and CEC may return to the State Water Board in 2021 to request an additional one-year extension of OTC Policy compliance dates for units that are scheduled to comply at the end of 2021. The CPUC, CAISO, and CEC communicated that they will not make such a recommendation unless an extension is absolutely necessary for grid reliability. Therefore, in order to ensure transparency, the energy agencies will provide quarterly reports to the State Water Board providing the status of all projects that are anticipated to be online by August 1, 2021, their targeted online dates, and any identified risk of delays.

20. Portions of California were subject to rotating power outages during mid-August 2020 due largely to unexpectedly high peak energy demands during widespread extreme high temperatures. The CPUC, CAISO, and CEC may be revising their forecasting models to account for this scenario, and may determine that there is a need to request additional extensions of final compliance dates to maintain grid reliability and avoid similar blackouts in the future.

21. Should there be a need for additional extensions, the OTC Policy provides expedited relief from final compliance dates as necessary to maintain grid reliability. Section 2.B(2)(a) of the OTC Policy allows the CAISO to notify the State Water Board that CAISO is extending the compliance date by 90 days (e.g., to March 31, 2022) as long as neither the CEC nor CPUC object in writing within ten days. If CAISO notifies the State Water Board that an extension beyond March 31, 2022, is needed for grid reliability, Section 2.B(2)(b) of the OTC Policy requires the State Water Board to conduct an expedited hearing within 90 days of receiving the notification. At the conclusion of the hearing, Section 2.B(2)(b) authorizes the State Water Board

to suspend the final compliance date indefinitely, pending its full evaluation and consideration of an amendment to the OTC Policy's final compliance date. Pursuant to Section 2.B(2)(d) of the OTC Policy, the State Water Board, in considering whether to suspend or amend the final compliance dates, shall afford significant weight to the recommendations of the CAISO. The State Water Board commits to act expeditiously to evaluate whether to suspend or amend the final compliance date beyond 90 days.

22. The State Water Board's primary responsibility and jurisdiction is to implement CWA 316(b) and ensure that the beneficial uses of the state's coastal and estuarine waters are protected. The compliance schedule revisions for Huntington Beach, Alamitos, Ormond Beach, and Redondo Beach are adopted in order to provide for grid reliability needed in the short term and should not be interpreted in any way as the State Water Board retreating from its goal of phasing out adverse environmental impacts resulting from use of coastal and estuarine waters for once-through cooling.

Diablo Canyon Nuclear Power Plant

23. On January 17, 2020, the State Water Board received a letter from the Pacific Gas and Electric Company (PG&E) requesting amendment of the OTC Policy compliance dates for Diablo Canyon Nuclear Power Plant Units 1 and 2 to conform with the expiration dates of the current Nuclear Regulatory Commission (NRC) licenses for each unit and PG&E's plan to permanently retire the units as approved by the CPUC in 2018. During development of the OTC Policy, PG&E noted the discrepancy of the OTC Policy compliance date not matching the NRC license expiration dates of Units 1 and 2. Following PG&E's decision to not pursue renewal of the NRC licenses for Units 1 and 2 beyond 2024 and 2025, PG&E requested an amendment to conform the compliance dates in the OTC Policy. The CPUC, in their D. 18-01-002, supports the operation of Unit 2 through the end of its current NRC license as part of Diablo Canyon's retirement plan.

24. The amendment to the OTC Policy shortens the compliance date for Diablo Canyon Nuclear Power Plant Unit 1 by approximately two months from December 31, 2024, to November 2, 2024, and extends the compliance date for Unit 2 by approximately nine months from December 31, 2024, to August 26, 2025. As reflected in Attachment A, the amendment will be made to the implementation schedule as new lines for Milestones 36 and 38 of Table 1 in Section 3.E.

25. PG&E will be required to continue complying with interim mitigation requirements up to and until final compliance with the OTC Policy.

Administrative Amendments

26. Section 3.B(5) of the OTC Policy states that the State Water Board shall consider the SACCWIS' recommendations for compliance date extensions and direct staff to make modifications to the OTC Policy, if appropriate, for the State Water Board member's consideration. As reflected in Attachment A, the amendment to Section

3.B(5) of the OTC Policy modifies this process so that the State Water Board will consider the SACCWIS' recommendations and consider modifications to the OTC Policy, if appropriate, without first directing staff to make modifications to the OTC Policy. In order to expeditiously address compliance date revisions recommended by the SACCWIS, staff may use information items and briefings to apprise State Water Board members of SACCWIS' recommendations while simultaneously drafting an amendment for State Water Board consideration as soon as practicable.

27. On March 27, 2014, LADWP sent a letter to the State Water Board requesting to change the annual due date of its grid reliability report from December 31 of a given year to January 31 of a given year. The additional month provides time for LADWP to incorporate information from the Ten-Year Transmission Assessment and the Integrated Resources Plan, which are finalized by December 31, into their grid reliability report and present the report to the LADWP Board of Water and Power Commissioners prior to submittal to the SACCWIS. In a letter dated April 24, 2014, the State Water Board directed LADWP to submit its annual grid reliability report by January 31 of each year pursuant to a Water Code Section 13383 letter order, and LADWP has done so since 2014. The amendment to Section 3.B(3) of the OTC Policy changes the due date of LADWP's annual grid reliability report from December 31 to January 31 of a given year, as reflected in Attachment A.

28. The amendment to the OTC Policy will reformat and non-substantively revise text in the OTC Policy to improve readability and comply with California Government Code Section 11546.7 document accessibility requirements.

California Environmental Quality Act

29. The California Natural Resources Agency approved the State Water Board's water quality control planning process as a certified regulatory program that adequately satisfies the California Environmental Quality Act (CEQA) requirements for preparing environmental documents (California Code of Regulations, title 23, section 3777). A substitute environmental document (SED) is used in place of an environmental impact report as CEQA environmental documentation.

30. The "Amendment to the Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling for Extension of Compliance Schedules of Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach Generating Stations Staff Report" ("Staff Report") contains the required environmental documentation under the State Water Board's CEQA regulations. The changes in compliance dates do not constitute a project within the meaning of CEQA. Nonetheless, the addendum to the Final SED adopted with the OTC Policy on May 4, 2010, concludes that revising compliance dates does not lead to new significant environmental impacts or a substantial increase in the severity of previously identified environmental effects. The addendum to the Final SED is included as Section 8 of the Staff Report.

31. Consistent with CEQA, the State Water Board finds the Staff Report does not engage in speculation, but rather analyzes the project and the alternatives to the project, and concludes that the project will not result in any additional environmental impacts.

Public Process

32. The State Water Board provided a written public comment period from March 18, 2020, through noon on May 18, 2020. During the comment period, the State Water Board held a public board workshop on April 21, 2020, providing an opportunity for open discussion between State Water Board members, staff, and the public on the proposed amendment to the OTC Policy.

33. The State Water Board carefully considered comments received and responded to comments. Based on the comments, the State Water Board revised the proposed amendment to the OTC Policy and the Staff Report. The responses to comments and revisions to the Staff Report do not add significant new information that is material to the State Water Board's decision or that would otherwise warrant action that is not a logical outgrowth of the proposed amendment that was previously subject to a written comment period. Therefore, it is not necessary to afford interested persons with another written comment period to address the responses to comments or revisions to the Staff Report.

34. The State Water Board conducted a public hearing in Sacramento on September 1, 2020, to solicit comments regarding the proposed amendment to the OTC Policy and has reviewed and carefully considered all comments and testimony received.

Effective Date

35. The amendment to the OTC Policy will become effective upon approval by the Office of Administrative Law.

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. Approves and adopts the Staff Report and Addendum to the 2010 Final SED and directs the Executive Director or designee to transmit the Notice of Decision to the Secretary of Resources.

2. Adopts the amendment to the OTC Policy as reflected in Attachment A.

3. Authorizes the Executive Director or designee to submit the amendment to the Office of Administrative Law for review and approval.

4. If, during the approval process, Water Board staff or the Office of Administrative Law determines that minor, non-substantive modifications to the language of the amendment are needed for clarity or consistency, the Executive Director or designee may make such changes and shall inform the State Water Board of any such changes.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on September 1, 2020.

AYE:	Chair E. Joaquin Esquivel Vice Chair Dorene D'Adamo Board Member Sean Maguire Board Member Laurel Firestone
NAY:	None
ABSENT:	Board Member Tam M. Doduc
ABSTAIN:	None

Jeanine Townsend
Clerk to the Board

AMENDMENT TO THE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING

TO REVISE COMPLIANCE SCHEDULES FOR ALAMITOS, HUNTINGTON BEACH, ORMOND BEACH, AND REDONDO BEACH GENERATING STATIONS AND DIABLO CANYON NUCLEAR POWER PLANT

FINAL STAFF REPORT

State Water Resources Control Board
September 1, 2020

State of California
Gavin Newsom, *Governor*

California Environmental Protection Agency
Jared Blumenfeld, *Secretary*

State Water Resources Control Board
https://www.waterboards.ca.gov/

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Eric Oppenheimer, *Chief Deputy Director*
Karen Mogus, *Division of Water Quality Deputy Director*

Prepared by:

Julie Johnson, Katherine Walsh, and Rebecca Fitzgerald
Division of Water Quality
State Water Resources Control Board
California Environmental Protection Agency

Table of Contents

Abbreviations and Acronyms

Abbreviation or Acronym	Full Name or Phrase
AES	AES-Southland, Inc.
Alamitos	Alamitos Generating Station
BTA	Best Technology Available
CAISO	California Independent System Operator
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CPUC	California Public Utilities Commission
CWA	Clean Water Act
Diablo Canyon	Diablo Canyon Nuclear Power Plant
GenOn	GenOn California South, GP
Huntington Beach	Huntington Beach Generating Station
IRP	Integrated Resource Planning
LADWP	Los Angeles Department of Water and Power
MGD	Million gallons per day
MW	Megawatt
NPDES	National Pollution Discharge Elimination System
NRC	United States Nuclear Regulatory Commission
Ormond Beach	Ormond Beach Generating Station
OTC	Once-through cooling
OTC Policy	Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling
PG&E	Pacific Gas & Electric Company
Redondo Beach	Redondo Beach Generating Station
Regional Water Board	Regional Water Quality Control Board
SACCWIS	Statewide Advisory Committee on Cooling Water Intake Structures
SED	Substitute Environmental Document
State Water Board	State Water Resources Control Board
TSO	Time Schedule Order
U.S. EPA	United States Environmental Protection Agency

1. Executive Summary

The State Water Resources Control Board (State Water Board) proposes an amendment to the statewide Water Quality Control Policy on the Use of Coastal and Estuarine Waters for Power Plant Cooling (Once-Through Cooling or OTC Policy) to extend the compliance dates for Alamitos, Huntington Beach, and Ormond Beach generating stations for three years until December 31, 2023, and Redondo Beach Generating Station for one year until December 31, 2021. Additionally, the State Water Board proposes administrative updates, including revisions regarding retirement of Diablo Canyon Nuclear Power Plant, and non-substantive changes.

The OTC Policy establishes uniform, technology-based standards to implement federal Clean Water Act (CWA) Section 316(b) and reduce the harmful effects associated with cooling water intake structures on marine and estuarine life. The State Water Board adopted the OTC Policy on May 4, 2010, under Resolution Number (No.) 2010-0020, and the Office of Administrative Law issued its approval on September 27, 2010. The OTC Policy became effective on October 1, 2010, and was amended in 2012, 2014, 2016, and 2017.

Originally, nineteen power plants located along the California coast withdrawing coastal and estuarine waters for cooling purposes using a single-pass system known as once-through cooling (OTC) were required to comply with the OTC Policy. Cooling water withdrawals cause adverse impacts when larger aquatic organisms, such as fish and mammals, are trapped against a facility's intake screens (impingement) and when smaller marine life, such as larvae and eggs, are killed by being drawn through the cooling system and exposed to high pressures and temperatures (entrainment).

The joint-agency Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS) was created to advise the State Water Board on the implementation of the OTC Policy, ensuring the compliance schedule takes into account the reliability of California's electricity supply, including local area reliability, statewide grid reliability, and permitting constraints. The SACCWIS includes representatives from the California Energy Commission (CEC), California Public Utilities Commission (CPUC), California Coastal Commission (Coastal Commission), California State Lands Commission, California Air Resources Board, California Independent System Operator (CAISO), and the State Water Board.

The OTC Policy established compliance dates for the nineteen power plants based on the planning and electricity procurement processes of the CEC, CAISO, and CPUC. These compliance dates were scheduled with orderly retirements and planned replacement of capacity aimed at maintaining local and system-wide electrical grid reliability in the State of California. The SACCWIS meets at least annually to review grid reliability studies from CAISO and Los Angeles Department of Water and Power (LADWP) and receive status updates on compliance from coastal power plants. Ten of the original nineteen power plants have permanently retired since adoption of the OTC Policy. The nine remaining power plants are scheduled to comply by specific compliance dates within the next decade, as presented in Table 1 of the OTC Policy.

Several compounding recent events have resulted in concern for system-wide grid reliability starting in the summer of 2021. These events include shifts in peak demand to later in the day and later in the year when solar and wind resources are not as reliably available to meet peak demand; related changes in the method for calculating the qualifying capacity of wind and solar resources resulting in lower qualifying capacity for these resources than previously determined; a significant increase in projected reliance on imported electricity over historical levels; and earlier-than-expected closures of some non-OTC power generating facilities. Starting in the summer of 2021, additional power is likely needed for peak usage on hot days through 2023.

At the March 8, 2019 annual SACCWIS meeting, committee members concluded that further analysis was necessary to determine if delays in the Mesa Loop-In transmission project could cause local grid reliability issues in the Western Los Angeles Basin in 2021. The SACCWIS met again on August 23, 2019, and January 23, 2020, to consider technical studies from CAISO and the CPUC's final decision in a short-term Integrated Resource Planning (IRP) process regarding identified local and system-wide grid reliability concerns. On January 23, 2020, the SACCWIS adopted a report recommending the State Water Board consider extending compliance dates of four power plants to address system-wide grid reliability as follows:

- Alamitos Generating Station (Alamitos) Units 3, 4, and 5 for three years until December 31, 2023;
- Huntington Beach Generating Station (Huntington Beach) Unit 2 for three years until December 31, 2023;
- Ormond Beach Generating Station (Ormond Beach) Units 1 and 2 for three years until December 31, 2023; and,
- Redondo Beach Generating Station (Redondo Beach) Units 5, 6, and 8 for one year until December 31, 2021.

This proposed amendment to the OTC Policy includes these compliance date extensions. These proposed compliance date extensions are in support of and in conjunction with CPUC's final Decision (D.)19-11-016, which ordered 3,300 megawatts (MW) of new procurement coming online in a phased schedule by the end of 2023.

Regarding mitigation of impacts to marine life, the OTC Policy includes a provision that existing power plants must implement measures to mitigate the interim impingement and entrainment impacts resulting from cooling water intakes during operation until final compliance with the OTC Policy (Section 2.C(3)). Accordingly, the continued use of OTC waters by Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach will be subject to continued interim mitigation requirements as detailed in Resolution No. 2015-0057 until the power plants come into final compliance.

This amendment also includes proposed administrative compliance date and non-substantive changes to the OTC Policy, including:

- Amending the compliance dates for Diablo Canyon Nuclear Power Plant (Diablo Canyon) Units 1 and 2 by reducing Unit 1 by two months and extending Unit 2 by eight months to November 2, 2024, and August 26, 2025, respectively. These revisions match the expiration date of each unit's United States Nuclear Regulatory Commission (NRC) license. These changes were requested by owner and operator Pacific Gas & Electric Company (PG&E) in a letter dated January 17, 2020. The current compliance date for both units is December 31, 2024. Extension of Unit 2's compliance date by eight months will address a previously-known discrepancy while implementing the terms of an agreement approved by the CPUC to retire Diablo Canyon.
- Amending Section 3.B(5) of the OTC Policy to clarify the amendment process.
- Amending Section 3.B(3) of the OTC Policy updating LADWP's annual grid reliability report due date from December 31 of each year to January 31 of each year.
- Including non-substantive changes to the OTC Policy to improve readability and comply with California Government Code Section 11546.7 requirements for document accessibility.

2. Regulatory Background

2.1. Regulatory Background and Authority

In 1972, Congress enacted the CWA to restore and maintain the chemical, physical, and biological integrity of the nation's waters. CWA Section 316(b) requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available (BTA) for minimizing adverse environmental impacts.

In 2001, the U.S. Environmental Protection Agency (U.S. EPA) adopted regulations for new power plants (Phase I) that established a performance standard for cooling water intakes based on closed-cycle wet cooling. In 2004, U.S. EPA published the Phase II rule applicable to existing power plants with a design intake flow greater than or equal to 50 million gallons per day (MGD), which was remanded following legal challenge.

On May 19, 2014, U.S. EPA finalized regulations covering existing facilities that withdraw at least 2 MGD of cooling water. Facilities select from options designed for reducing impingement to meet BTA requirements. Facilities that withdraw at least 125 MGD are required to conduct studies to investigate site-specific controls to reduce entrainment impacts. New units added to existing facilities are subject to similar requirements established for new facilities. The new regulation was published in the Federal Register on August 15, 2014, and became effective on October 14, 2014 (U.S. EPA, 2014).

The State Water Board is designated as the state water pollution control agency for all purposes under the CWA. The State of California's Porter-Cologne Water Quality Control Act of 1969 authorizes the State Water Board to adopt statewide water quality control plans and policies, which are implemented through National Pollution Discharge Elimination Systems (NPDES) permits and waste discharge requirements. The OTC

Policy adopted by the State Water Board on May 4, 2010, under Resolution No. 2010-0020, established requirements for the implementation of Section 316(b) for existing coastal power plants in California, using best professional judgment in determining BTA for cooling water intake structures. The BTA was determined to be closed-cycle wet cooling, or equivalent. The OTC Policy is implemented through NPDES permits, issued pursuant to CWA Section 402, which authorizes the point source discharge of pollutants to navigable waters. The OTC Policy initially assigned the State Water Board as the entity responsible for issuing or modifying NPDES permits for power plants subject to the Policy. A subsequent OTC Policy amendment adopted pursuant to State Water Board Resolution No. 2013-0018 returned responsibility for these NPDES permits to the power plant's corresponding Regional Water Quality Control Board (Regional Water Board).

All facilities subject to the OTC Policy are required to comply with applicable regulatory requirements that are designed to minimize environmental impacts and protect human health, including all state and local permits. If the compliance dates are extended, these OTC facilities would continue to be regulated by applicable air and water quality permits, therefore continuing to comply with requirements imposed in order to minimize environmental impacts and be protective of human health.

Because the OTC Policy requirements are equivalent to, if not more stringent than those contained in applicable U.S. EPA regulations, those requirements continue to govern the existing coastal power plants in California. The U.S. EPA rule explicitly states that it is within the states' authority to implement requirements that are more stringent than the federal requirements.

2.2. Requirements When Amending the OTC Policy

The State Water Board must comply with all state and federal public participation requirements and state laws governing environmental and peer review when amending the OTC Policy.

The State Water Board is the lead agency for this project under the California Environmental Quality Act (CEQA) and is responsible for preparing any required environmental documentation for the amendment. The California Secretary of Resources has certified the State Water Board's water quality planning process as exempt from certain CEQA requirements when adopting plans, policies, and guidelines, including preparation of an initial study, negative declaration, and environmental impact report.

CEQA imposes specific obligations on the State Water Board when it establishes performance standards. Public Resources Code Section 21159 requires that an environmental analysis of the reasonably foreseeable methods of compliance be conducted. The environmental analysis must address the reasonably foreseeable environmental impacts of the methods of compliance, reasonably foreseeable alternatives, and mitigation measures.

In order to comply with CEQA an addendum to the May 4, 2010 *Final Substitute Environmental Documentation* (SED, hereafter referred to as the 2010 Final SED) is presented in Section 8 below.

Health and Safety Code Section 57004 requires external scientific peer review of the scientific basis for any rule proposed by any board, office, or department within the California Environmental Protection Agency. However, because this amendment does not establish a new regulatory level, standard or other requirement based on scientific findings, conclusions or assumptions, peer review requirements do not apply.

3. Project Description

The State Water Board is proposing an amendment to the OTC Policy to extend the compliance dates of four OTC power plants scheduled to retire on December 31, 2020, to address system-wide grid reliability concerns and to bridge the gap as new electrical resources come online through 2023. This amendment is based upon the SACCWIS' analysis of alternatives and recommended alternative in its final report adopted on January 23, 2020. This amendment would extend the compliance dates for Alamitos, Huntington Beach, and Ormond Beach for three years until December 31, 2023, and Redondo Beach for one year until December 31, 2021. If adopted, these changes would be reflected in Section 3.E, Table 1 of the OTC Policy.

Additionally, the State Water Board proposes the following amendments in order to update and improve the readability of the OTC Policy:

- Amending the compliance dates for Diablo Canyon Units 1 and 2 in Section 3.E, Table 1 from December 31, 2024, to match their respective NRC license expiration dates of November 2, 2024, for Unit 1 (two-month reduction) and August 26, 2025, for Unit 2 (eight-month extension);
- Clarifying the most expeditious amendment process in Section 3.B(3) so that owners or operators are able to stay in compliance with current permits while ensuring grid reliability;
- Revising the due date for annual grid reliability reports from LADWP in Section 3.B(5) from December 31 of each year to January 31 of each year, as directed by the State Water Board on April 24, 2014; and,
- Including non-substantive administrative changes to improve readability and comply with California Government Code Section 11546.7 requirements for document accessibility.

Proposed language changes to the OTC Policy are presented in a draft amendment and are shown in red underline for added text and red strikeout for deleted text.

4. Environmental Setting

Section 2.1 of the 2010 Final SED describes the environmental settings of regions with existing OTC power plants. Power plants recommended for compliance date extensions are located in the following regions: Central Coast – Region 3 (Section 2.1.3), Los Angeles – Region 4 (Section 2.1.4), and Santa Ana – Region 8 (Section

2.1.6) (State Water Board, 2010). As illustrated below, Sections 2.2 through 2.6 of the 2010 Final SED describe baseline environmental impacts associated with operation of coastal power plants using once-through cooling.

5. Rationale and Considerations for System-Wide Grid Reliability Compliance Date Extensions

5.1. Grid Reliability

The compliance date extensions are needed to ensure system-wide grid reliability. Starting in the summer of 2021, additional power is likely needed for peak usage on hot days through 2023.

The SACCWIS met on March 8, 2019, concluding in its annual *2019 Final SACCWIS Report* that no OTC Policy compliance date extensions were recommended at that time. However, the SACCWIS identified potential local grid reliability issues in the Western Los Angeles Basin related to delays in the Mesa Loop-In transmission project and determined that further analysis was needed to determine if local grid reliability would be impacted.

On June 20, 2019, the Assigned Commissioner and Administrative Law Judge in the CPUC IRP proceeding (Rulemaking R.16-02-007) issued a ruling that identified a potential system capacity shortfall of between 2,300 and 4,400 MW in the CAISO Balancing Authority Area beginning in the summer of 2021. The ruling asked interested parties to comment on the analysis leading to the determination of a potential capacity shortfall and to propose solutions to address a shortfall. The analysis found that the shortfall arises from several factors, including shifts in peak demand to later in the day (shifting from 4 p.m. - 6 p.m. to 7 p.m. - 9 p.m.) and later in the year (shifting from August to September) when solar and wind resources are not as reliably available to meet peak demand; changes in the method for calculating the qualifying capacity of wind and solar resources resulting in lower qualifying capacity for these resources than previously determined; uncertainty regarding the level of imports on which California can depend in the future as other states also shift towards using more renewable energy resources; and unanticipated retirements of five non-OTC generating units.

In July 2019, the CAISO completed its *2021 Limited Local Capacity Technical Study* in consultation with the CPUC and CEC in advance of the 2021 annual local resource adequacy study cycle. Although the baseline study did not show a need for Alamitos to support local grid reliability in 2021, sensitivity studies in the report did show a potential need. CAISO concluded in the report that due to the risk associated with forecast uncertainty for higher demand and at-risk-of-retirement generation capacity, it would be prudent to seek an extension of Alamitos' compliance date beyond December 31, 2020. Extending the compliance date for Alamitos would also assist with the potential need for additional system-wide capacity starting in 2021. However, actual procurement levels and the need for system capacity depended on forthcoming technical studies and the CPUC's continuing short-term IRP process that began in June 2019.

The SACCWIS convened on August 23, 2019, to consider local grid reliability issues in the Western Los Angeles Basin and emergent system-wide grid reliability issues. Committee members approved the *Local and System-Wide 2021 Grid Reliability Studies* report (hereafter referred to as the August 23, 2019 SACCWIS Report), recommending the State Water Board consider extending the compliance date for Alamitos Units 3, 4, and 5 by two or more years to support local and system-wide grid reliability concerns, and some portion of the 2,579 MW available from Huntington Beach, Ormond Beach, and Redondo Beach to address system-wide grid reliability concerns. Without amending the OTC Policy, the compliance date for all four power plants is December 31, 2020. The SACCWIS acknowledged in the August 23, 2019 SACCWIS Report the need to reconvene to discuss a recommendation for system-wide grid reliability following additional research and conclusion of the CPUC's IRP process in R.16-02-007.

After receiving comments, on November 7, 2019, the CPUC adopted D.19-11-016. In the decision, the CPUC directed 3,300 MW of new capacity procured by 2023, with 50% of this procurement due to come online by August 1, 2021; 75% by August 1, 2022; and 100% by August 1, 2023, to address the system-wide capacity shortfall. The decision limits the amount of new natural gas that could be used to meet the procurement requirements. The decision also recommended the following phased extensions to the OTC Policy compliance dates for specific generating units to support the procurement schedule: an extension of Alamitos Units 3, 4, and 5 and Huntington Beach Unit 2 for up to three years, an extension of Redondo Beach Units 5, 6, and 8 for up to two years, and an extension of Ormond Beach Units 1 and 2 for up to one year. These compliance date extensions would provide a "bridge" of roughly 3,740 MW in 2021, roughly 2,230 MW in 2022, and roughly 1,380 MW in 2023 as the 3,300 MW of new procurement comes online by 2023.

A representative from the SACCWIS presented the recommendations and analysis from the August 23, 2019 SACCWIS Report to the State Water Board at an informational item on November 19, 2019, to apprise the State Water Board members of identified local and system-wide grid reliability concerns. The SACCWIS had stated its intent to reconvene and inform the State Water Board of its final recommendations for compliance date extensions in early 2020.

On January 23, 2020, the SACCWIS convened and approved the *Recommended Compliance Date Extensions for Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach Generating Stations* report (hereafter referred to as the January 23, 2020 SACCWIS Report), presenting alternatives and a preferred recommendation to the State Water Board to consider extending the aforementioned four power plants by up to three years to address system-wide grid reliability issues. The alternatives from the approved January 23, 2020 SACCWIS Report are listed below.

Alternatives from the January 23, 2020 SACCWIS Report

1. **No action:** In this alternative, there would be no changes to the OTC Policy. The four generating stations would stop using ocean water for once-through

cooling on or before December 31, 2020. California may experience black-outs or brown-outs during times when electrical demand is high and imports are unreliable due to similar high demands in other states or balancing authority areas.

2. **Extend OTC Policy Compliance Dates for All Power Plants for Three Years:** Extend the compliance dates for all of the following available OTC units for three years, until December 31, 2023: Alamitos Units 3, 4, and 5 (1,163 MW); Huntington Beach Unit 2 (215 MW); Redondo Beach Units 5, 6, and 8 (848 MW); and Ormond Beach Units 1 and 2 (1,516 MW).

   This alternative would maximize (at roughly 3,740 MW) the existing OTC capacity available to meet reliability needs as 3,300 MW of new capacity comes online pursuant to D.19-11-016. This would also maximize the buffer of available capacity if there are delays in new procurement, at least through the end of 2023.

   As discussed in D.19-11-016, some stakeholders argued that Ormond Beach and Redondo Beach in particular have harmful impacts on local communities and extensions of these power plants may interfere with existing plans for redevelopment of the associated properties (see D.19-11-016, page 20).

3. **Extend OTC Policy Compliance Dates for All Power Plants with Phased Compliance Dates:** Extend the compliance dates for all available OTC units in the following phased approach: Alamitos Units 3, 4, and 5 for three years until December 31, 2023; Huntington Beach Unit 2 for three years until December 31, 2023; Redondo Beach Units 5, 6, and 8 for two years until December 31, 2022; and Ormond Beach Units 1 and 2 for one year until December 31, 2021.

   Concluding each extension on December 31st of the proposed year would ensure the availability of capacity for contracting during peak months and could simplify contracting efforts by aligning with resource adequacy requirements and procurement timelines. This alternative would provide a "bridge" of roughly 3,740 MW in 2021, roughly 2,230 MW in 2022, and roughly 1,380 MW in 2023 as the 3,300 MW of new procurement comes online by 2023.

   This alternative is recommended by the CPUC in D.19-11-016 and is intended to minimize the harmful impacts on local communities near Ormond Beach and Redondo Beach expressed by stakeholders.

   The SACCWIS recognized that Alternative 3 would address system-wide grid reliability needs.

4. **Extend OTC Policy Compliance Dates for All Power Plants with Phased Compliance Dates Modified from Alternative 3:** Extend the compliance dates for all available OTC units in a phased approach with different compliance dates for Ormond Beach and Redondo Beach than Alternative 3. Extend Alamitos Units 3, 4, and 5 for three years until December 31, 2023; Huntington Beach Unit 2 for three years until December 31, 2023; Ormond Beach Units 1 and 2 for three

years until December 31, 2023; and Redondo Beach Units 5, 6, and 8 for one year until December 31, 2021.

Similar to Alternative 3, this alternative would ensure the availability of capacity for contracting during peak months and could simplify contracting efforts by aligning with resource adequacy requirements and procurement timelines. This alternative would provide a "bridge" of roughly 3,740 MW in 2021 and roughly 2,892 MW in 2022 and 2023 as the 3,300 MW of new procurement comes online by 2023.

This alternative is partly responsive to comments from the city mayors of Redondo Beach and Hermosa Beach to the State Water Board on November 19, 2019. Both cities expressed opposition to an extension of Redondo Beach's OTC Policy compliance date. Extending Redondo Beach for one year would ensure the availability of that capacity for contracting during 2021.

Additionally, the State Water Board received a comment from the Oxnard City Manager on November 18, 2019, noting support for an extension of Ormond Beach Units 1 and 2 if Oxnard City Council and GenOn California South, GP (GenOn) agree on a plan to perform comprehensive decommissioning, dismantling, and remediation of the site. A representative from the City of Oxnard provided comment at the January 23, 2020 SACCWIS meeting stating that the Oxnard City Council unanimously approved a proposed plan for the decommissioning and remediation of Ormond Beach.

At the January 23, 2020 meeting, the SACCWIS approved Alternative 4 as its preferred recommendation to the State Water Board. In formulating alternatives for the Amendment, the recommendations of the SACCWIS were afforded significant weight due to the unanimous recommendation of the energy agencies in accordance with Section 3.B.(5) of the OTC Policy. The proposed extensions of Alternative 4 are part of a "least regrets" strategy to minimize the risk of an electrical shortage, which is consistent with the CPUC's responsibility to ensure safe and reliable electric service. The CPUC determines the difficult balance of having too few system resources, which could lead to actual energy shortages or and/or market manipulation opportunities for owners of system resources (leading to risk of additional ratepayer costs) versus having an excess of system resources available, which also could lead to unnecessary ratepayer costs. Therefore, the SACCWIS, informed by the CPUC and the CAISO's analyses, is fulfilling its responsibility under the OTC Policy by recommending extensions to the compliance dates of the four OTC facilities mentioned above to bridge the gap of the projected electrical shortfall while new procurement comes online to ensure grid reliability through 2023.

In addition to the technical studies, decisions, and reports listed above that were reviewed in developing the SACCWIS alternatives, other factors and new information acquired after preparation of the January 23, 2020 SACCWIS Report that should be considered are discussed below.

In March 2020, the CPUC updated its recommendation for Ormond Beach from a one-year extension to a three-year extension in D.20-03-028, consistent with SACCWIS' Alternative 4. It should be noted that GenOn filed a joint Petition for Modification with the City of Oxnard asking the CPUC to change D.19-011-016 so that it recommended a three-year extension for Ormond Beach rather than a one-year extension. The CPUC denied the Petition for Modification, finding in D.20-03-028 that it is ultimately not necessary for the CPUC to amend D.19-011-016 to change its recommendation on the Ormond Beach OTC Policy compliance deadline because the SACCWIS had already recommended that the State Water Board accept the three-year extension negotiated by the City of Oxnard with GenOn.

The need to extend the four OTC facilities to address system grid reliability concerns as specified in SACCWIS Alternative 4 above was reconfirmed in a May 27, 2020 joint letter submitted by the CAISO, the CPUC, and the CEC to the State Water Board. The energy agencies reiterated that during proceedings of the CPUC IRP, the CAISO submitted a detailed analysis that suggests an RA deficiency of up to 2,300 MW during the gross peak demand hour in 2021. This projection only takes into account the qualifying capacity of available resources. When taking into account reduced solar generation available to meet peak demand from 4 PM to 9 PM, this deficiency may be as high as 4,400 MW.

Furthermore, the CAISO analysis is based on the average historical capacity of all other available resources, such as wind, hydroelectric, and imports, and it assumes that there will be no transmission or generation outages that exceed the planning reserve margin. This analysis also did not account for other factors that may impact available capacity, such as drought, climate change, increased competition for imports, risk of higher load than 1-in-2-year forecast load, or risk to transmission systems due to wildfires.

Taken together, the above factors support extending the compliance deadlines. As stated in the May 27, 2020 letter, while the CPUC, CEC, and CAISO cannot confirm that all capacities of the four OTC facilities will be dispatched to meet system-wide grid reliability needs in 2021, the capacity of these OTC resources, both individually and combined, is needed to compensate for the band of uncertainty and projected supply shortfalls that have been identified in 2021.

The ongoing coronavirus disease 2019 ("COVID-19") pandemic has increased uncertainty in numerous ways. Potential impacts from COVID-19, including the potential for disruption to manufacture, shipment, or delivery of equipment; labor disruptions from quarantines; travel restrictions; shelter-at-home and social distancing requirements; or other areas as a result of the pandemic, may create new delay risks. Potential delays may also result from other COVID-19-related supply chain issues and/or potential permitting or inspection delays related to agency staff, budget, or procedural constraints.

In response to concerns regarding the effects of COVID-19, the CPUC, CAISO, and CEC assessed potential impacts of COVID-19 on the progress of new resource development as ordered in the CPUC's D.19-11-016. The CPUC established a process to track the procurement and development of the new resources. Currently, the process suggests that most projects needing to be developed by August 1, 2021, are meeting

their development milestones. The CPUC is continuing to monitor development of the new 1,650 MW of new resources targeted to come online by August 1, 2021. However, if the CPUC's tracking of project development indicates a significant risk of delay in project online dates that would put California's electricity reliability at risk, the CPUC, CAISO, and CEC may return to the State Water Board in 2021 to request an additional one-year extension of OTC Policy compliance dates for units that are scheduled to comply at the end of 2021. The CPUC, CAISO, and CEC have communicated that they will not make such a recommendation unless an extension is absolutely necessary for grid reliability. Therefore, in order to ensure transparency, the energy agencies will provide quarterly reports to the State Water Board providing the status of all projects that are anticipated to be online by August 1, 2021, their targeted online dates, and any identified risk of delays.

The State Water Board will assess additional recommendations pursuant to existing provisions in the OTC Policy, including, if necessary, compliance date suspension options in Section 2.B(2).

5.2. Frequency of Power Plant Operation

System-wide grid reliability requires that power supply and demand must be equal at any given moment so as to avoid placing unnecessary stresses on the electrical transmission system. To effectively maintain balance within a Balancing Authority Area, the responsible balancing authority continuously forecasts, monitors, and adjusts electrical supply to meet demand. Balancing supply and demand can be achieved through several processes, one of which is the dispatch of generation assets by the responsible balancing authority.

As power demand is variable and production is tied to an array of factors, some types of electrical generation assets are dispatched to serve load more frequently than others, while other generation assets are generally reserved for peak demand, or contingency, periods. The power plants reserved for peak demand periods are colloquially referred to as "peaker plants" or "peakers." To demonstrate an example of the role peakers play in maintaining grid reliability, energy usage typically spikes during heat waves, when air-conditioning usage is widespread. These periods often require the dispatching of peakers to serve load. Because conventional generators often take time to reach their allocated output and serve load, it is sometimes necessary to dispatch multiple units in a similar time frame to meet demand. In the context of OTC facilities, this means that one OTC facility generally cannot produce as much energy as multiple OTC generators in a short time frame, thus necessitating the need to extend the compliance dates for the four OTC facilities included in the Amendment to address grid reliability concerns starting in 2021. Peakers also play a role in maintaining grid reliability during emergency scenarios, such as natural disasters that damage, destroy, or otherwise require the shutdown of electrical generation or transmission infrastructure.

Since 2016, Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach power plants have primarily been used like peakers and have operated on average over the last three years at 4.8% of capacity. If the compliance date for Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach are extended, the power plants would

continue to primarily be used like peakers and would be expected to run at or below their current operating capacity.

Additionally, the dispatch order of generation resources is generally driven by marginal costs of operation, where resources with lower marginal costs are typically dispatched before those with higher costs. The age of older OTC units means they have higher marginal costs of operation. Since resources are generally dispatched when demand drives energy prices above those resources' costs, newer and more efficient existing resources are generally used before resorting to using the OTC power plants. As replacement procurement comes online over the next three years, the OTC units will likely be used less frequently.

If future IRP processes by the CPUC show that the OTC units are no longer necessary to ensure system-wide grid reliability during the approved extended compliance date periods, owners and operators could elect to retire the units early.

5.3. Impacts to Marine Life

Sections 2.2 and 2.3 of the 2010 Final SED established baseline impacts to marine life through analysis of impingement and entrainment studies conducted from 2000-2005 at eighteen of the nineteen coastal OTC power plants. The consensus among regulatory agencies at both the state and federal levels is that OTC systems contribute to the degradation of aquatic life in their respective ecosystems. Installation of reasonably foreseeable methods of compliance were found to reduce either impingement or entrainment impacts by 90% to 97%, depending on the technology selected.

The 2010 Final SED showed that OTC units among the nineteen power plants operated at varying efficiencies (volume of cooling water in millions of gallons required per megawatt-hour generated), depending on the type of boiler system and general age of the unit. For example, combined-cycle units were found to be up to 50% more efficient than steam boilers. Alamitos Units 3, 4, and 5, Huntington Beach Unit 2, Ormond Beach Units 1 and 2, and Redondo Beach Units 5, 6, and 8 are all steam boilers, with Redondo Beach Units 5 and 6 being the oldest at 1954 and 1957, respectively. Of the four power plants, Redondo Beach is the least efficient, requiring more OTC intake water to produce a megawatt-hour than the other power plants, and resulting in potential impacts to marine life (Figure 11 in the 2010 Final SED).

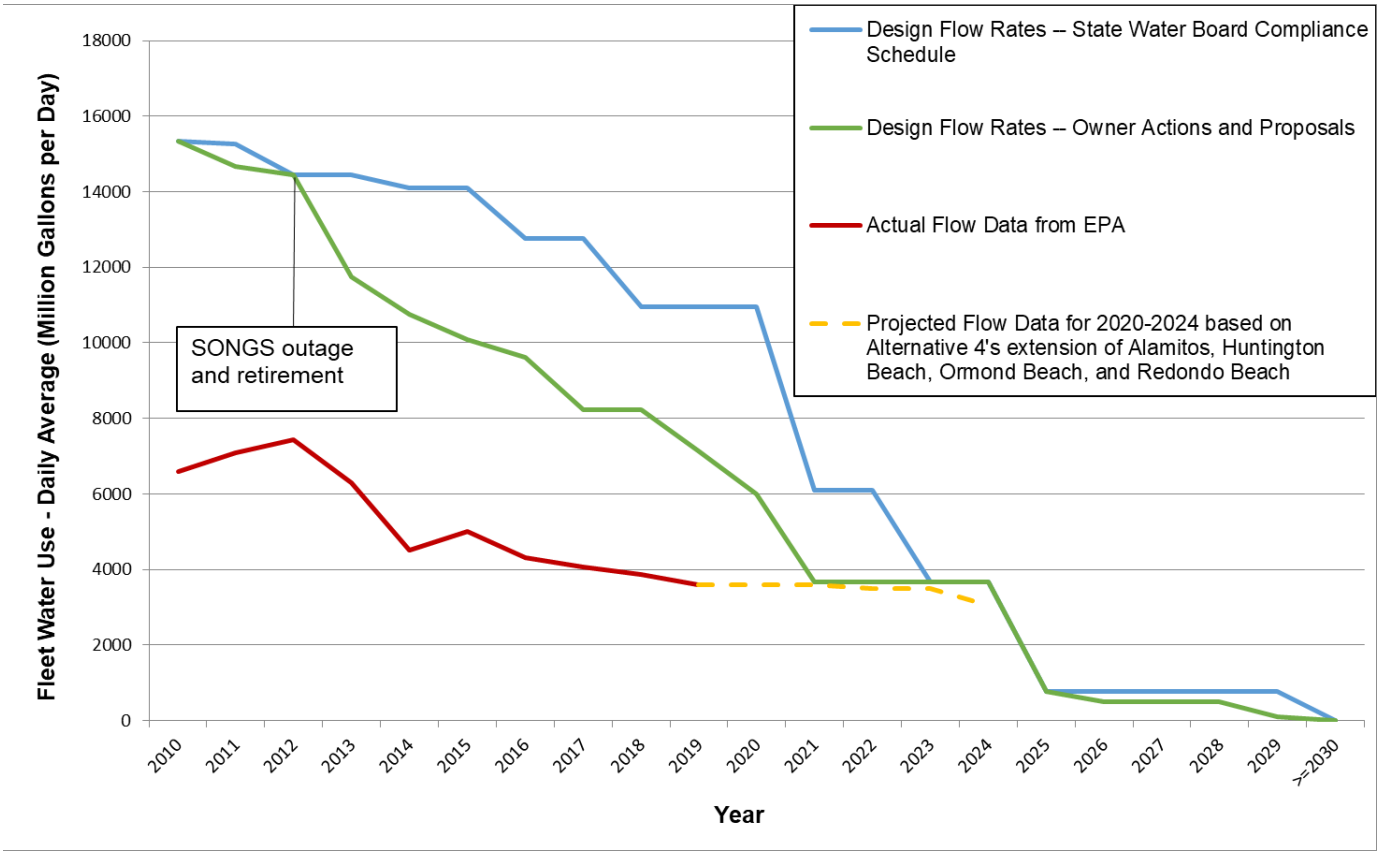
Since adoption of the OTC Policy, Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach have operated at decreasing capacities, with average annual capacity factors decreasing from 7.7% in 2012 to 4.4% in 2018. If extended, these four OTC power plants are expected to be operated at or below annual average capacity factors from 2018, thereby minimizing impingement and entrainment impacts.

As shown in Figure 1, if the compliance dates for Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach are extended as recommended in the SACCWIS' Alternative 4 and the plants operate at current capacity, the daily average OTC water use on a statewide scale is projected to be at or below design flow rates from the

original OTC Policy compliance schedule. Projected flow rates for the four power plants are based on the average daily flow rates for 2019.

Based on the discussion above, impacts to marine life are expected to be at or below the baseline established in the 2010 Final SED if the compliance dates for Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach are extended for up to 3 years.

Figure 1: Historic and Projected OTC Fleet Water Use – Daily Average Flow Rate in Million Gallons per Day



5.4. Mitigation of Impingement and Entrainment Impacts

The OTC Policy includes a provision that existing power plants must implement measures to mitigate the interim impingement and entrainment impacts resulting from cooling water intakes during operation commencing October 1, 2015, and continuing up to and until the owner or operator achieves final compliance. Section 2.C(3) of the OTC Policy provides options for owners or operators to demonstrate compliance with the interim mitigation requirements.

AES, owner and operator of Alamitos, Huntington Beach, and Redondo Beach, elected to comply with the interim mitigation requirements through Section 2.C(3)(b) by providing funding to the Ocean Protection Council or California Coastal Conservancy to fund appropriate mitigation projects. After purchasing Ormond Beach from NRG Energy, Inc. in 2018, GenOn elected to continue complying with interim mitigation

requirements for the power plant through Section 2.C(3)(b). Accordingly, the continued use of OTC waters from Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach will be subject to continued interim mitigation requirements as detailed in Resolution No. 2015-0057 up to and until the power plants come into compliance with the OTC Policy.

Since October 1, 2015, $3.52 million in interim mitigation funds have been paid by the owners and operators of Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach to fund appropriate mitigation projects. Payments are calculated in determinations prepared by State Water Board staff on an annual basis, from October 1 through September 30 of a given year. The calculations are based on the total volume of intake water and pounds of marine life impinged in accordance with Resolution No. 2015-0057. Since use of the aforementioned power plants is expected to be at or below recent levels, the interim mitigation requirements currently in place are sufficient to offset impingement and entrainment impacts incurred during the extended operation of the power plants, if approved. Additional mitigation would be above and beyond what was determined as appropriate in Resolution No. 2015-0057, implementing the findings of the OTC Policy.

5.5. Land Use Impacts

The 2010 Final SED concluded that no land use impacts were identified regarding OTC power plant compliance with requirements of the OTC Policy. This conclusion was based on the 2008 report by Tetra Tech, which evaluated the technical and logistical feasibility of retrofitting 15 of the State's fossil-fueled coastal OTC power plants with closed-cycle wet cooling systems (pages 104 and G-229, 2010 Final SED). Revisions to OTC Policy compliance dates based upon non-marine impacts to local communities, including land use concerns and environmental justice, may be considered but are largely beyond the scope of the State Water Board's authority under Clean Water Act section 316(b) and the OTC Policy.

Power generation is expected to be ongoing at both the Alamitos and Huntington Beach sites. To date, AES has retired Alamitos Units 1, 2, and 6; Huntington Beach Unit 1, and Redondo Beach Unit 7 to enable the new combined cycle gas turbines at Alamitos and Huntington Beach to be placed in service (SACCWIS, 2019a). Power generation is expected to cease at the Ormond Beach and Redondo Beach sites after the power plants retire. Post-retirement community considerations for the Ormond Beach and Redondo Beach sites are discussed below.

Ormond Beach

The Ormond Beach facility is located within City of Oxnard in Ventura County, where many persons of color and low-income populations work in high outdoor exposure agricultural areas. The facility is situated within an area that is designated as a disadvantaged community on the Office of Environmental Health and Hazard Assessment's CalEnviroScreen 3.0 Map (OEHHA, 2018). According to the CalEnviroScreen, the facility is located in a census tract considered by the State of California to have a higher pollution burden than 98% of other areas in the state.

Public comments were heard at the State Water Board meeting on November 19, 2019, following the SACCWIS's presentation on the August 23, 2019 SACCWIS Report. A representative from GenOn informed the State Water Board that GenOn and the City Manager of Oxnard were in negotiations regarding demolition and remediation plans in Agreement Number (No.) A-8207: *Agreement for Demolition and Remediation of the Ormond Beach Generating Station* for consideration by the Oxnard City Council.

Agreement No. A-8207 establishes a timeline and financial plan for the demolition and remediation of Ormond Beach, funded by GenOn up to $25 million, if the State Water Board approves a compliance date extension through 2023. On January 21, 2020, the Oxnard City Council unanimously approved and authorized the Mayor to execute Agreement No. A-8207 (City Council of Oxnard Meeting Minutes, 2020). A representative of the Oxnard City Council spoke to this approved agreement at the January 23, 2020 SACCWIS meeting. The representative shared the City Council's support for SACCWIS Alternative 4, which would extend the compliance date of Ormond Beach Units 1 and 2 for three years until December 31, 2023.

Additionally, a 3-year extension of Ormond Beach's compliance date would be most beneficial to Oxnard, as section 3.a of Agreement No. A-8207 indicates that GenOn commits to completing demolition and remediation of the Ormond Beach site by December 31, 2025 if the power plant's compliance date is extended until 2023 and Ormond Beach is the subject of resource adequacy or other market-based contracts for all or any portions of calendar years 2021, 2022, and 2023. If Ormond Beach's compliance date is extended for shorter periods of time, GenOn will provide less funding towards demolition and remediation (since the power plant would not be operating as long) and post-retirement work would be completed one to two years later.

GenOn filed a joint Petition for Modification with the City of Oxnard asking the CPUC to change D.19-11-016 so that it recommended a three-year extension for Ormond Beach rather than a one-year extension. The CPUC denied the Petition for Modification, finding in D.20-03-028 that since the SACCWIS had already recommended the three-year extension for Ormond Beach to the State Water Board that was negotiated by the City of Oxnard and GenOn, it was not necessary to amend D.19-11-016 to change its recommendation on the Ormond Beach compliance date extension. Furthermore, the CPUC updated its recommendation for Ormond Beach from a one-year extension to a three-year extension in D.20-03-028, consistent with SACCWIS' Alternative 4.

The State Water Board acknowledges that disadvantaged communities often disproportionately experience environmental impacts and is committed to taking environmental justice concerns into account. For more information on the Water Board's environmental justice program, please see https://www.waterboards.ca.gov/water_issues/programs/outreach/education/justice.shtml.

Redondo Beach

Several public comments were heard at both the November 19, 2019 State Water Board meeting and the January 23, 2020 SACCWIS meeting regarding extension of the compliance date for Redondo Beach Units 5, 6, and 8.

Starting in 2018, AES entered into negotiations for the sale of the Redondo Beach property to developer SLH Fund, LLC (SLH). As stated by both the owner of SLH and AES, an agreement is in place for AES to lease back the property and continue operating Redondo Beach if the power plant's compliance date is extended by the State Water Board. In its comment letter to the SACCWIS for the January 23, 2020 meeting, SLH supported SACCWIS Alternative 3 to extend the compliance date for Redondo Beach for two years until December 31, 2022. In its May 18, 2020 comment letter to the State Water Board on the proposed amendment, SLH revised its support to be in favor of a three-year extension of Redondo Beach through December 31, 2023. SLH stated that during any extension of the power plant's compliance date, AES would provide it access to unused portions of the site for remediation and continuing operation of the power plant would not delay redevelopment efforts. Additionally, SLH stated that any extension of the compliance date would provide additional funding towards site clean-up.

The City of Redondo Beach is working with SLH to purchase approximately half of the Redondo Beach property for wetland restoration and developing parkland for public use, as stated in four comment letters. Last year, the City of Redondo Beach received a grant from the California Natural Resources Agency for $4.8 million for the partial purchase of 15 acres of the Redondo Beach property, including historical wetlands, for restoration as part of a regional park. The California Natural Resources Agency confirmed that if the power plant's compliance date is extended beyond December 31, 2020, this grant funding will be retained by the City of Redondo Beach.

In 2015, the Coastal Commission confirmed jurisdictional wetlands exist in the former tank basin area on the Redondo Beach property, totaling 5.93 acres. In 2017 and 2018, AES submitted applications for and received three emergency coastal development permits to dewater the former tank basin and was denied a fourth. The pumping, or dewatering, occurred due to safety concerns regarding water near utility and electrical lines. Sometime before May 2020, AES stopped using the groundwater pumping system and installed portable sump pumps in utility vaults. The pumping occurred due to safety concerns regarding water near utility and electrical lines.

The Coastal Commission issued a Notice of Violation to AES and SLH on May 26, 2020, for illegally dewatering the wetlands through the unpermitted installation and use of groundwater pumps in the former tank basin area and the installation and use of new portable pumps to dewater utility vaults that may be hydrologically connected to the wetlands in the former tank basin. To resolve the violation, AES was asked to complete the following: cease any unpermitted dewatering of the former tank basin area; submit by June 30, 2020, a complete Coastal Development Permit application to the City of Redondo Beach seeking authorization to remove the dewatering system in the former tank basin and either retain or remove the vault pumping system; and submit to the City of Redondo Beach and the Coastal

Commission by June 30, 2020, a response to information requests in the Notice of Violation related to the vault pumping system.

According to information provided by the Coastal Commission, a member agency of the SACCWIS, the Coastal Commission received AES' Coastal Development Permit application on June 30, 2020, providing alternatives and seeking authorization to permanently retire or remove the groundwater dewatering system from the former tank basin area. If the compliance schedule extension is granted, neither AES or SLH are absolved from complying with existing state and local permits, laws, and regulations.

The NOV issued by the Coastal Commission and this proposed Amendment do not impede the State Water Board or the Coastal Commission from acting according to their individual responsibilities and legal requirements. The Coastal Commission will continue to its role in ensuring that fulfills the other requirements of the NOV so that the facility is operated in compliance with all applicable laws and regulations. Additionally, it should be noted that any litigation between the Coastal Commission and AES will proceed separately from regulation of AES pursuant to the proposed OTC Policy amendment and the State Water Board's authority.

5.6. Air Quality Impacts

Extending the operation of the four power plants will extend the existing air, noise, and aesthetic impacts; however, impacts are expected to remain less than the baseline established in the 2010 Final SED. Noise and aesthetic impacts related to compliance with the OTC Policy were determined to be less than significant in the 2010 Final SED. The State Water Board found in the 2010 Final SED that it could not accurately assess air quality impacts related to compliance with the OTC Policy because it was difficult to estimate the method of compliance owners and operators would select for each power plant.

To date, most OTC owners and operators have elected to comply with the OTC Policy by retiring the OTC units, except for Moss Landing Power Plant, which is complying through Track 2 by implementing mechanical upgrades and seasonal operation to reduce OTC intake flow rates equivalent to what would be achieved through Track 1 compliance (Section 2.A(2) of the OTC Policy). Some OTC sites have been repowered with new, more efficient combined-cycle gas turbines to replace retired capacity. Due to the combination of OTC unit retirements in a phased schedule and replacement of capacity with newer, more efficient resources that produce fewer emissions, as was investigated as a potential compliance scenario in the 2010 Final SED, implementation of the OTC Policy is expected to show a modest reduction of existing air quality impacts caused by operation of OTC units.

All operating power plants producing emissions are permitted to run by local air quality management districts, which require scheduled monitoring and reporting from the operators to ensure compliance and public safety. If compliance dates are extended, the OTC power plants would likely be used as peakers. Air impacts are expected to be at or below recent levels, which are typically within permitted limits.

There are environmental justice concerns regarding pollution from plants into the air basin and the potential impacts this may have on human health. The Air Toxics Hot Spots Information and Assessment Act (see California Health and Safety Code Section 44360(b)(2)) requires facilities to do a health risk analysis every four years to determine whether citizens will be exposed to any harmful pollutants. Facilities will additionally conduct toxic emissions evaluations as required by the South Coast Air Quality Management District. If there is a visible pollution event, there are guidelines and permit regulations in place to account for these emissions. Ormond Beach is currently in compliance with all permits and regulations and has not seen any violations or exceedances of their air quality permits for the past two years. Redondo Beach is also currently in compliance with all permits, local, regional, and state regulations that were developed to be protective of human health including ambient air quality standards and Title V. The latest breakdown and/or deviation at Redondo Beach causing excess emissions was the breakdown of a fan feeding oxygen to Unit No. 6 resulting in visible emissions (black smoke) that occurred on July 25, 2019; the breakdown was rectified, and the event stopped in 8 minutes. This black smoke event did not result in an NOV and Redondo Beach has not received any NOVs for excess emissions in the past 10 years.

The State Water Board may consider these pollution issues; however, the State Water Board is primarily responsible for implementing Section 316(b) of the Clean Water Act while taking into account local area and system-wide grid reliability in California. The State Water Board relies upon the energy agencies within the SACCWIS to inform recommendations on grid reliability and extensions of compliance dates for existing OTC facilities. The SACCWIS recommendations were informed by CPUC proceedings to avoid forecasted shortfalls in energy supplies. Revisions to OTC Policy compliance dates based upon non-marine impacts to local communities, including air quality, may be considered but are largely beyond the scope of the State Water Board's authority under Clean Water Act section 316(b) and the OTC Policy. Additionally, continued operation of Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach is not expected to result in air impacts greater than those reported as baseline air emissions in Section 2.6 of the 2010 Final SED.

5.7. OTC Policy Amendment Preferred Approach

The State Water Board proposes an amendment to the OTC Policy consistent with the SACCWIS' Alternative 4, extending the compliance dates for Alamitos Units 3, 4, and 5, Huntington Beach Unit 2, and Ormond Beach Units 1 and 2 for three years until December 31, 2023, and Redondo Beach Units 5, 6, and 8 for one year until December 31, 2021. This amendment balances the need for grid reliability with marine life, land use, and air quality concerns.

<u>Other Regulatory and Permitting Requirements</u>

An amendment of the OTC Policy with compliance date extensions will necessitate changes to associated NPDES permits, time schedule orders (TSO), total maximum

daily loads, if applicable, and air permits. An up-to-date description of air permit needs is included in the January 23, 2020 SACCWIS Report.

Alamitos, Redondo Beach, and Ormond Beach are located within the Los Angeles Regional Water Board's jurisdiction. Huntington Beach is located within the Santa Ana Regional Water Board's jurisdiction. The State Water Board is coordinating with Regional Water Boards on developing amendments to the OTC Policy and regional regulatory documents. The Los Angeles Regional Water Board intends to consider reopening and amending the TSO, NPDES permit, and San Gabriel River Metals Total Maximum Daily Load for Alamitos; the TSO and NPDES permit for Redondo Beach; and the NPDES permit for Ormond Beach. Additionally, the Santa Ana Regional Water Board may need to consider reopening and amending the NPDES permit for Huntington Beach.

6. Administrative Compliance Updates and Non-Substantive Changes

6.1. Administrative Compliance Date Changes

On January 23, 2020, the State Water Board received a letter from PG&E requesting that the State Water Board amend the compliance dates for Diablo Canyon Units 1 and 2 by reducing Unit 1 by two months and extending Unit 2 by eight months to match each unit's respective NRC license expiration date. The current compliance date in the OTC Policy for both Diablo Canyon units is December 31, 2024. The NRC license expiration date is November 2, 2024, for Unit 1 and August 26, 2025, for Unit 2. It is PG&E's preference to operate both units up to the end of the current NRC licenses (PG&E, 2020).

In 2018, PG&E formally withdrew its applications to renew the NRC licenses for Units 1 and 2 in accordance with CPUC D.18-01-022, which approved the retirement of Diablo Canyon for resource planning purposes. Unit 1 will cease operations by November 2, 2024. If Unit 2's OTC Policy compliance date is not amended to conform with its NRC license expiration date, it will not operate beyond December 31, 2024.

PG&E requests amending the compliance dates for Diablo Canyon Units 1 and 2 to conform with the current NRC license expiration dates for each unit for the following reasons:

- **Discrepancy acknowledged during OTC Policy development in 2010:** During development of the OTC Policy and the adoption process, PG&E identified the discrepancy between the NRC license expiration dates for both units and the compliance date listed in Section 3.E, Table 1 of the OTC Policy. The State Water Board acknowledged the discrepancy and said that compliance dates could be updated to match the NRC license expiration dates in a future amendment.
- **CPUC approval of Diablo Canyon retirement:** In 2016, PG&E submitted a Joint Proposal to Retire Diablo Canyon Nuclear Power Plant at Expiration of the Current Operating Licenses and Replace It With a Portfolio of GHG Free Resources with six other parties to the CPUC for consideration of a plan to retire Diablo Canyon and replace the capacity with preferred greenhouse gas-free

resources (PG&E, 2016). In the proposal, PG&E planned to operate Diablo Canyon until the expiration of the NRC licenses for Units 1 and 2, on November 2, 2024, and August 26, 2025, respectively. In Section 6.2 of the proposal, PG&E stated that in order to clarify the authority of Diablo Canyon Unit 2 to operate beyond December 31, 2024, it would ask the State Water Board for an amendment to the OTC Policy to conform the compliance dates for Diablo Canyon Units 1 and 2 to the actual expiration of the respective NRC operating licenses (PG&E, 2016). On January 11, 2018, the CPUC adopted D.18-01-022, which approved the retirement of Diablo Canyon Unit 1 by 2024 and Unit 2 by 2025 (CPUC, 2018).

- **Baseline support for grid reliability:** Diablo Canyon's approximately 2,200 MW capacity of greenhouse gas-free energy are a benefit to the state's ongoing effort to combat global climate change. Extension of Unit 2 to its NRC license expiration date of August 26, 2025, would provide eight additional months of greenhouse gas-free power as new preferred resources are constructed and come online in accordance with the procurement ordered by the CPUC in D.19-11-016.
- **Continued interim mitigation requirements:** Section 2.C.(3) of the OTC Policy requires that existing power plants must implement measures to mitigate the interim impingement and entrainment impacts resulting from using OTC technology during operation prior to final compliance with the OTC Policy. If Unit 2's compliance date is amended to August 26, 2025, impacts to marine life from impingement and entrainment would be offset in accordance with Resolution No. 2015-0057.

The State Water Board considers the proposed amendment to the compliance dates of Diablo Canyon Units 1 and 2 to conform with current NRC license expiration dates of November 2, 2024, for Unit 1 and August 26, 2025, for Unit 2 to be administrative. During development of the OTC Policy, PG&E noted the discrepancy of the OTC Policy compliance date not matching the NRC license expiration dates of Units 1 and 2. Compliance with the OTC Policy by the nuclear-fueled power plants was the subject of a review committee established to oversee special studies investigating compliance alternatives for the two plants. Following PG&E's decision to not pursue renewal of the NRC licenses for Units 1 and 2 beyond 2024 and 2025, and establishing retirement as the chosen compliance option, they decided to request an amendment to conform the compliance dates. Operation of Unit 2 to the end of its current NRC license is supported by CPUC D.18-01-022 and plays an important role in ensuring effective implementation of PG&E's retirement plan for Diablo Canyon.

Amending Unit 2's compliance date from December 31, 2024, to August 26, 2025, will provide an additional eight months of approximately 1,100 MW of capacity with zero-carbon emissions. Although Diablo Canyon uses large volumes of water compared to the other OTC power plants, impingement impacts are relatively low due to the environmental setting and Diablo Canyon's intake structure design. With the retirement of Unit 1 by November 2, 2024, the volume of intake water and associated entrainment impacts of Unit 2 if extended to August 26, 2025, are expected to be approximately half

of current use. Therefore, operating Diablo Canyon Unit 2 for an additional eight months is expected to be at or below baseline impacts to marine life and other environmental impacts established in the 2010 Final SED.

Considerations

1. **No action:** If the OTC Policy compliance date for Units 1 and 2 is unchanged, Unit 1 will cease operations early by November 2, 2024, on the date of its NRC license expiration date and Unit 2 will cease operations by December 31, 2024.
2. **Conform the compliance dates with NRC license expiration dates:** Table 1 of the OTC Policy will be amended, changing the compliance date of Diablo Canyon Units 1 and 2 from December 31, 2024, to match the NRC license expiration dates of November 2, 2024, for Unit 1 and August 26, 2025, for Unit 2. Both units will cease operations by the dates planned for by PG&E and in full compliance with established permits and operating licenses.

OTC Policy Amendment Preferred Approach

The State Water Board proposes to amend the OTC Policy consistent with Consideration 2 to reduce the compliance date of Diablo Canyon Unit 1 by two months to November 2, 2024 and extend the compliance date of Unit 2 by eight months to November 2, 2024. This change would conform the compliance dates of both units with the NRC license expiration dates and would allow operation of both units to the end of the licenses. Furthermore, this is in line with the CPUC's D.18-01-022 and supports future procurement processes by providing certainty for approximately 1,100 MW of zero-carbon energy from Unit 2 until August 26, 2025.

6.2. Clarifying the Extension Process

Section 3.B(5) of the OTC Policy states that the State Water Board shall consider the SACCWIS' recommendations for compliance date extensions and direct staff to make modifications to the OTC Policy, if appropriate, for the State Water Board member's consideration. In practice, this would require multiple public meetings rather than a single public hearing and adoption meeting to consider a proposed amendment to the OTC Policy. Owners and operators of OTC power plants facing compliance date extensions require certainty to balance their compliance plans, permitting, and operation needs with the need for continued operation of the OTC units to support grid reliability. A shorter process for developing proposed amendments and bringing them to the State Water Board for consideration best accomplishes this.

In order to expeditiously address compliance date revisions recommended by the SACCWIS, State Water Board staff has used information items and briefings to apprise Board Members of the SACCWIS recommendations while simultaneously drafting an amendment for Board consideration as soon as practicable.

OTC Policy Amendment Preferred Approach

The State Water Board proposes to amend Section 3.B(5) to state that the State Water Board will consider the SACCWIS' recommendations and consider modifications to the

OTC Policy, if appropriate. This clarifying language reflects the most expeditious process in developing amendments for the State Water Board's consideration.

6.3. LADWP Reporting Process Update

Section 3.B(3) of the OTC Policy requires the CAISO and LADWP to each submit to the SACCWIS, by December 31 of each calendar year, a grid reliability study for their respective jurisdictions that has been developed pursuant to a public process and approved by their governing bodies. These grid reliability studies are reviewed by the SACCWIS and used as sources in the SACCWIS' annual update to the State Water Board on the implementation of the OTC Policy and grid reliability.

On March 27, 2014, LADWP requested that the due date for the annual grid reliability report be changed from December 31 of each year to January 31 of each year. The primary reason for its request to change the date is that two reports, the Ten-Year Transmission Assessment and the Integrated Resources Plan, that the annual grid reliability report relies upon are not completed and finalized until December 31 of each year. Therefore, LADWP requested an extension of the annual report due date by one month to January 31 of each year in order to produce the annual grid reliability report and bring it to the LADWP Board of Water and Power Commissioners for approval before submittal to the SACCWIS.

In order to effectuate the requested change in a timely manner, the Executive Director of the State Water Board, in a letter dated April 24, 2014, directed LADWP to submit its annual grid reliability report by January 31 of each year pursuant to a Water Code Section 13383 letter order.

The proposed revision is administrative and is meant to conform the OTC Policy with the approved change in due date of LADWP's annual grid reliability reports. CAISO's annual grid reliability reports due date will remain unchanged.

OTC Policy Amendment Preferred Approach

The State Water Board proposes to amend Section 3.B(3) of the OTC Policy to update LADWP's annual grid reliability report due date from December 31 of each year to January 31 of each year as directed in the State Water Board's April 24, 2014 letter.

6.4. Non-Substantive Administrative Changes

The State Water Board proposes an amendment to the OTC Policy with non-substantive administrative updates in the OTC Policy to improve readability and comply with California Government Code Section 11546.7 accessibility requirements.

7. Analysis of Alternatives

This section presents alternatives of the proposed amendments to the OTC Policy.

- **Alternative 1** – No action. The four generating stations would stop using ocean water for once-through cooling on or before December 21, 2020. California may experience black-outs or brown-outs during times when electrical demand is high and imports are unreliable due to similar high demands in other states or

balancing authority areas. None of the administrative compliance updates or non-substantive changes discussed above would be made to the OTC Policy.

- **Alternative 2** – The OTC Policy would be updated with compliance date extensions to support system-wide grid reliability in accordance with SACCWIS Alternative 3 and CPUC D.19-11-016. The compliance dates for Alamitos and Huntington Beach would be extended for three years until December 31, 2023; Redondo Beach would be extended for two years until December 31, 2022; and Ormond Beach would be extended for one year until December 31, 2021. The administrative compliance updates and non-substantive changes discussed above would not be made to the OTC Policy.

- **Alternative 3** – The OTC Policy would be updated with compliance date extensions to support system-wide grid reliability in accordance with SACCWIS Alternative 4. The compliance dates for Alamitos, Huntington Beach, and Ormond Beach would be extended for three years until December 31, 2023, and Redondo Beach would be extended for one year until December 31, 2021. The administrative compliance updates and non-substantive changes discussed above would not be made to the OTC Policy.

- **Alternative 4** – The OTC Policy would be updated with compliance date extensions to support system-wide grid reliability in accordance with SACCWIS Alternative 3 and CPUC D.19-11-016. The compliance dates for Alamitos and Huntington Beach would be extended for three years until December 31, 2023; Redondo Beach would be extended for two years until December 31, 2022; and Ormond Beach would be extended for one year until December 31, 2021.

  The administrative compliance updates and non-substantive changes discussed in Section 6 would be made in the OTC Policy. The compliance dates for Diablo Canyon Units 1 and 2 would be amended from December 31, 2024, to conform with the NRC license expiration dates of November 2, 2024, for Unit 1 (two-month reduction) and August 26, 2025, for Unit 2 (eight-month extension). Changes would be made to Sections 3.B(3) and 3.B(5) with clarified language and the approved due date for LADWP annual grid reliability reports. Non-substantive changes to improve readability and comply with California Government Code Section 11546.7 document accessibility requirements would be made to the OTC Policy.

- **Alternative 5** – The OTC Policy would be updated with compliance date extensions to support system-wide grid reliability in accordance with SACCWIS Alternative 4. The compliance dates for Alamitos, Huntington Beach, and Ormond Beach would be extended for three years until December 31, 2023, and Redondo Beach would be extended for one year until December 31, 2021.

  The administrative compliance updates and non-substantive changes discussed in Section 6 would be made in the OTC Policy. The compliance dates for Diablo Canyon Units 1 and 2 would be amended from December 31, 2024, to conform with the NRC license expiration dates of November 2, 2024, for Unit 1 (two-

month reduction) and August 26, 2025, for Unit 2 (eight-month extension). Changes would be made to Sections 3.B(3) and 3.B(5) with clarified language and the approved due date for LADWP annual grid reliability reports. Non-substantive changes to improve readability and comply with California Government Code Section 11546.7 document accessibility requirements would be made to the OTC Policy.

OTC Policy Amendment Preferred Alternative

The State Water Board proposes an amendment to the OTC Policy consistent with Alternative 5. Alternative 5 would extend the compliance dates for Alamitos, Huntington Beach, and Ormond Beach for three years until December 31, 2023, and would extend Redondo Beach for one year until December 31, 2021. Diablo Canyon Unit 1's compliance date would be shortened to November 2, 2024, and Unit 2's compliance date would be extended to August 26, 2025, matching the NRC license expiration date of each unit. Additionally, all administrative compliance updates and non-substantive changes discussed above would be made to the OTC Policy. The need to extend the four OTC facilities to address system grid reliability concerns as specified in SACCWIS Alternative 4 was reconfirmed in a May 27, 2020 joint letter submitted by the CAISO, the CPUC, and the CEC to the State Water Board. In accordance with Section 3.B.(5) of the OTC Policy, the State Water Board shall afford significant weight to the unanimous recommendation of the energy agencies.

8. Addendum to the 2010 Final SED

Title 23, California Code of Regulations, Sections 3720-3782 requires the State Water Board to evaluate potential environmental impacts that may be caused by complying with the amendment with one or more of the reasonably foreseeable compliance methods. The 2010 Final SED for the OTC Policy describes and evaluates potential environmental impacts associated with installation of better technologies, closed-cycle wet cooling or equivalent, and potential mitigation measures for associated impacts. An addendum to a previously certified environmental impact report or equivalent such as a substitute environmental document is appropriate if some changes or additions are necessary but none of the conditions requiring preparation of a subsequent environmental document have occurred.

Section 5.1 above describes new developments concerning the need for continued operation of Alamitos, Huntington Beach, Ormond Beach and Redondo Beach to ensure grid reliability. This includes the CPUC proceeding reflecting potential shortfalls due to shifts in demand and unexpected retirements of other power generation. Section 6.1 describes changed circumstances relative to the original OTC Policy with regard to plans for retirement of Diablo Canyon. This additional information provides updates and clarifications to the 2010 Final SED.

Following is a summary of the major findings of the 2010 Final SED.

Water Quality and Biological Resources

The 2010 Final SED concluded that less than significant (where the effect will not be significant and mitigation is not required) to no environmental impacts would result from implementation of the evaluated reasonably foreseeable methods of compliance with the OTC Policy. The State Water Board evaluated potential changes in effluent limitations in the case of installation of cooling towers to comply with the OTC Policy. Water quality impacts were considered less than significant for Alamitos and two others out of the nineteen OTC power plants. Although these three power plants could face difficulty meeting effluent limitations as a retrofitted facility, the State Water Board did not consider these impacts significant because each power plant is already unlikely to meet effluent limitations; compliance with the OTC Policy does not cause the impact. Complying with the OTC Policy was determined to result in no impacts to water quality beyond the established baseline at the other sixteen OTC power plants.

AES and GenOn intend to retire all OTC units at Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach by the compliance dates adopted by the State Water Board, which will significantly reduce OTC-related impacts to marine life and water quality from the baseline conditions established in the 2010 Final SED (SWB, 2018 and GenOn, 2019).

Utilities and Service Systems

Impacts to the electrical grid due to implementation of the OTC Policy were considered to be less than significant with mitigation. Disruptions to utility services and grid reliability would be most effectively mitigated by establishing a statewide policy that included provisions to consult with the state's energy agencies and coordinate implementation among the Regional Water Boards. The SACCWIS, established by the OTC Policy, monitors statewide grid reliability to identify potential electrical shortages potentially brought about by implementation of the OTC Policy. Due to projected electrical shortfalls starting in 2021, in its January 23, 2020 SACCWIS Report, the SACCWIS recommended the State Water Board consider extending the compliance dates of Alamitos Units 3, 4, and 5; Huntington Beach Unit 2; and Ormond Beach Units 1 and 2 for three years until December 31, 2023, and Redondo Beach Units 5, 6, and 8 for one year until December 31, 2021.

Air Quality

The State Water Board evaluated potential impacts to air quality in three scenarios assuming that all OTC units deemed feasible are retrofitted to either closed-cycle wet cooling or closed-cycle dry cooling systems and new combined-cycle generation or increased capacity at retrofitted OTC units replaces the nuclear OTC units at Diablo Canyon and San Onofre Nuclear Generating Station. It was determined that air quality impacts related to complying with the OTC Policy could not accurately be assessed because it was difficult to estimate the method of compliance owners and operators would select for each power plant. The 2010 Final SED concluded that complying with the OTC Policy with a combination of OTC unit retirements and replacement of capacity

with newer, more efficient resources that produce fewer emissions would be expected to show no change to a modest reduction of existing baseline air quality impacts caused by operation of OTC units.

Aesthetics and Noise

Noise and aesthetic impacts related to compliance with the OTC Policy were determined to be less than significant in the 2010 Final SED. If cooling towers were installed as a method of compliance with the OTC Policy, appropriate mitigation would be required to offset aesthetic and noise impacts.

This proposed amendment would not affect the identified reasonably foreseeable methods of compliance with the OTC Policy, nor would it result in any new significant environmental impacts or a substantial increase in the severity of previously identified significant effects beyond what was identified in the 2010 Final SED, as illustrated by the above discussion, together with sections 5.3, 5.5, 5.5, and 6.1. Therefore, continued operation of Alamitos, Huntington Beach, Ormond Beach, Redondo Beach and Diablo Canyon under their current operational configuration does not constitute an increase in impacts relative to the baseline identified in the 2010 Final SED and does not require subsequent or supplemental environmental analysis.

9. Water Code Section 13140 and Other Required Considerations

9.1. Economic Analysis

The 2010 Final SED provides information on the costs of compliance with the OTC Policy. In the event of extension of the compliance dates for Alamitos, Huntington Beach, Ormond Beach, and Redondo Beach, some cost to the owners and operators is anticipated for maintaining trained staff and resources to continue operations and interim mitigation payments for up to three years beyond December 31, 2020. These costs are considered as cost of compliance with the OTC Policy and are consistent with those discussed in the 2010 Final SED.

9.2. The Human Right to Water

Once-through cooling water use is not included in Resolution No. 2016-0010, which adopted the human right to water as a core value of the State and Regional Water Boards. The primary goal of the OTC Policy to is protect marine life from the harmful impacts of impingement and entrainment associated with the use of cooling water intake structures. Therefore, the directives of Resolution No. 2016-0020 are not applicable to this proposed amendment to the OTC Policy.

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FINAL AMENDMENT TO THE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING

State Water Resources Control Board
September 1, 2020

WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING

1. Introduction

   A. Clean Water Act Section 316(b) requires that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available (BTA) for minimizing adverse environmental impact. Section 316(b) is implemented through National Pollutant Discharge Elimination System (NPDES) permits, issued pursuant to Clean Water Act Section 402, which authorize the point source discharge of pollutants to navigable waters.

   B. The State Water Resources Control Board (State Water Board) is designated as the state water pollution control agency for all purposes stated in the Clean Water Act.

   C. The State Water Board and Regional Water Quality Control Boards (Regional Water Boards) (collectively Water Boards) are authorized to issue NPDES permits to point source dischargers in California.

   D. Currently, there are no applicable nationwide standards implementing Section 316(b) for *existing power plants*[1]. Consequently, the Water Boards must implement Section 316(b) on a case-by-case basis, using best professional judgment.

   E. The State Water Board is responsible for adopting state policy for water quality control, which may consist of water quality principles, guidelines, and objectives deemed essential for water quality control.

   F. This Policy establishes requirements for the implementation of Section 316(b), using best professional judgment in determining BTA for cooling water intake structures at existing coastal and estuarine power plants that must be implemented in NPDES permits.

   G. The intent of this Policy is to ensure that the beneficial uses of the State's coastal and estuarine waters are protected while also ensuring that the electrical power needs essential for the welfare of the citizens of the State are met. The State Water Board recognizes it is necessary to develop replacement infrastructure to maintain electric reliability in order to implement this Policy and in developing this policy considered costs, including costs of compliance, consistent with state and federal law.

[1] An asterisk indicates that the term is defined in Section 5 of the Policy.

H. During the development of this Policy, State Water Board staff has met regularly with representatives from the California Energy Commission (CEC), California Public Utilities Commission (CPUC), California Coastal Commission (CCC), California State Lands Commission (SLC), California Air Resources Board (ARB), and California Independent System Operator (CAISO) to develop realistic implementation plans and schedules for this Policy that will not cause disruption in the State's electrical power supply. The compliance dates for this Policy were developed considering a report produced by the energy agencies (CEC, CPUC, and CAISO), titled "Implementation of OTC Mitigation Through Energy Infrastructure Planning and Procurement Changes," and the accompanying table, titled "Draft Infrastructure Replacement Milestones and Compliance Dates for Existing Power Plants in California Using Once Through Cooling (OTC)," included in the Substitute Environmental Document for this Policy. The energy agencies' approach seeks to address the replacement, repowering, or retirement of power plants currently using OTC that (1) maintains reliability of the electric system; (2) meets California's environmental policy goals; and (3) achieves these goals through effective long-term planning for transmission, generation and demand resources. The energy agencies have stated that the dates specified in their report may require periodic updates.

I. To prevent disruption in the State's electrical power supply when the Policy is implemented, the State Water Board will convene a Statewide Advisory Committee on Cooling Water Intake Structures (SACCWIS), which will include representatives from the CEC, CPUC, CAISO, CCC, SLC, ARB, and State Water Board. SACCWIS will review implementation plans and schedules submitted by dischargers pursuant to this Policy, and advise the State Water Board on the implementation of this Policy to ensure that the implementation schedule takes into account local area and grid reliability, including permitting constraints. The State Water Board recognizes the compliance dates in this Policy may require amendment based on, among other factors, the need to maintain reliability of the electric system as determined by the energy agencies included in the SACCWIS, acting according to their individual or shared responsibilities. The State Water Board retains the final authority over changes to the adopted policy.

J. While the CEC, CPUC and CAISO each have various planning or permitting responsibilities important to this effort, the approach relies upon use of competitive procurement and forward contracting mechanisms implemented by the CPUC in order to identify low cost solutions for most OTC power plants. The CPUC has authority to order the investor-owned utilities (IOUs) to procure new or repowered fossil-fueled generation for system and/or local reliability in the Long-Term Procurement Plan (LTPP) proceeding. In response to the Policy, the CPUC anticipates modifying its LTPP proceeding and procurement processes to require the IOUs to assess replacement infrastructure needs and conduct targeted requests for offers (RFOs) to acquire replacement, repowered or otherwise compliant generation capacity. LTPP proceedings are conducted on a biennial cycle and plans are normally

approved in odd-numbered years. The next cycle, the 2010 LTPP, is estimated to result in a decision by 2011. The subsequent cycle, the 2012 LTPP, would in turn result in a decision by 2013. Once authorized to procure by a CPUC LTPP decision, the IOUs need approximately 18 months to issue an RFO, sign contracts, and submit applications to the CPUC for approval. Approval by the CPUC takes approximately nine months. If the contract involves a facility already licensed through the CEC generation permitting process, then financing and construction can begin. A typical generation permitting timeline is 12 months, but specific issues such as ability to obtain air permits can delay the process. IOUs often give preference to RFO bids with permits already (or nearly) in place. V From contract approval, construction usually takes three years, if generation permits are approved, or approximately five years, if generation permits are pending or other barriers present delays. In total, starting from the initiation of an LTPP proceeding (2010 LTPP or 2012 LTPP), seven years are expected to elapse, before replacement infrastructure is operational. Due to the number of plants affected, efforts to replace or repower OTC power plants would need to be phased.

K. Because the Los Angeles region presents a more complex and challenging set of issues, it is anticipated that more time would be needed to study and implement replacement infrastructure solutions. Therefore, total elapsed time is expected to begin in 2010 and end in 2017 for the Greater Bay Area and San Diego regions, which would be addressed beginning in the 2010 LTPP. For the Los Angeles region, which would be addressed beginning in the 2012 LTPP, total elapsed time is expected to begin in 2012 and end in 2020. A transmission solution is expected to have approximately the same timeframe, but could be delayed by greater potential for significant local opposition. In order to assure that repowering or *new power plant** development in the Los Angeles basin addresses unique permitting challenges, the SACCWIS will assist the State Water Board in evaluating schedules for power plants not under the jurisdiction of the CPUC or operating within the CAISO Balancing Authority Area.

L. The Global Warming Solutions Act of 2006 requires California to reduce greenhouse gas emissions to 1990 levels by 2020 and then to maintain those reductions. California presently has two *nuclear-fueled power plants** that provide approximately 4,600 megawatts of baseload electricity and do not emit greenhouse gases during energy generation. Energy generation by facilities that do not emit greenhouse gases will be critical to meeting the mandates of the Global Warming Solutions Act and emerging national and international greenhouse gas reduction requirements. The *nuclear-fueled power plants** are entering into United States Nuclear Regulatory Commission (Commission) license renewal proceedings unique to the nuclear power industry and relicensing may extend the plants operating lives to approximately 2045. Unlike older era fossil-fueled plants, if the *nuclear-fueled power plants** undergo modernization as part of relicensing or cooling structure upgrades, that modernization will not reduce greenhouse gas

emissions, and in fact, extended downtime during modernization may result in short-term increases in greenhouse gases as other greenhouse gas emitting facilities provide makeup power. In recognition of these considerations and others, this Policy requires special studies for the *nuclear-fueled power plants** to address their unique issues, and to evaluate appropriate requirements for those plants.

M. To conserve the State's scarce water resources, the State Water Board encourages the use of recycled water for cooling water in lieu of marine, estuarine or fresh water.

N. The Regional Water Boards are responsible for all NPDES permit actions for *existing power plants** subject to this Policy, including without limitation actions to issue, modify, reissue, revoke, and terminate NPDES permits after October 1, 2010. In order to ensure a high level of statewide consistency in implementing Section 316(b), the State Water Board Division of Water Quality (DWQ) staff will provide technical support in all issues related to implementation of the OTC Policy.

O. Nothing in this Policy precludes the authority of the State Water Board and the Regional Water Board to regulate discharges from *existing power plants** through NPDES permits, consistent with water quality standards.

2. Requirements for *Existing Power Plants**

A. Compliance Alternatives. An owner or operator of an *existing power plant** must comply with either Track 1 or Track 2, below.

(1) Track 1. An owner or operator of an *existing power plant** must reduce *intake flow rate** at each unit, at a minimum, to a level commensurate with that which can be attained by a *closed-cycle wet cooling system**. A minimum 93 percent reduction in *intake flow rate** for each unit is required for Track 1 compliance, compared to the unit's design *intake flow rate**. The through- screen intake velocity must not exceed 0.5 foot per second. The installation of closed cycle dry cooling systems meets the intent and minimum reduction requirements of this compliance alternative.

(2) Track 2. If an owner or operator of an *existing power plant** demonstrates to the State Water Board's satisfaction that compliance with Track 1 is *not feasible**, the owner or operator of an *existing power plant** must reduce impingement mortality and entrainment of marine life for the facility, on a unit- by-unit basis, to a comparable level to that which would be achieved under Track 1, using operational or structural controls, or both.

(a) Compliance for impingement mortality shall be determined either:

(i) For plants relying solely on reductions in velocity, by monthly verification of through-screen intake velocity not to exceed 0.5 foot per second, or

(ii) By monitoring required in Section 4.A, below. For measured reductions determined by monitoring, the owner or operator must reduce impingement mortality to a comparable level to that which would be achieved under Track 1. A "comparable level" is a level that achieves at least 90 percent of the reduction in impingement mortality required under Track 1.

(b) Compliance for entrainment shall be determined either:

(i) For plants relying solely on reductions in flow, by recording and reporting reductions in terms of monthly flow, in which case a minimum of 93% reduction in flow, as compared to the average actual flow for the corresponding months from 2000 – 2005, must be met, or

(ii) For plants relying in whole or in part on other control technologies (e.g., including but not limited to screens or re-location of intake structures), by measured reductions in entrainment determined by monitoring required in Section 4.B, below. The owner or operator must reduce entrainment to a comparable level to that which would be achieved under Track 1. A "comparable level" is a level that achieves at least 90 percent of the reduction in entrainment required under Track 1. If screens are employed to reduce entrainment, compliance shall be determined based on *ichthyoplankton**, and on the crustacean phyllosoma and megalops larvae, and squid paralarvae fractions of *meroplankton**.

(c) Technology-based improvements that are specifically designed to reduce impingement mortality and/or entrainment and were implemented prior to October 1, 2010 may be counted towards meeting Track 2 requirements.

(d) The owner or operator of an *existing power plant** with *combined-cycle power-generating units** installed prior to October 1, 2010 may achieve compliance in accordance with this paragraph.

The owner or operator may count prior reductions in impingement mortality and entrainment resulting from the replacement of steam turbine power-generating units with *combined-cycle power-generating units**, towards meeting Track 2 requirements. Reductions shall be based on reductions in intake flows, calculated as the difference between:

(i) The maximum permitted discharge (expressed as million gallons per day (MGD)) for the entire power plant as identified in the plant's prior NPDES permit that authorized the steam turbine power-generating units which were subsequently replaced with the *combined-cycle power-generating units**, and

(ii) The maximum permitted discharge (expressed as MGD) for the entire power plant, including the combined cycle units, as identified in the plant's NPDES permit authorizing the *combined-cycle power- generating units**.

B. Final Compliance Dates

(1) *Existing power plants** shall comply with Section 2.A, above, as soon as possible, but no later than, the dates shown in Table 1, contained in Section 3.E, below.

(2) Based on the need for continued operation of an *existing power plant** to maintain the reliability of the electric system, a final compliance date may be suspended under the following circumstances:

(a) **Suspension of Final Compliance Date for Less Than 90 Days for *Existing Power Plants** Within CAISO Jurisdiction.** If CAISO determines that continued operation of an *existing power plant** is necessary to maintain the reliability of the electric system in the short- term, CAISO shall provide written notification to the State Water Board, the Regional Water Board with jurisdiction over the *existing power plant**, and the SACCWIS. If the Executive Directors of the CEC and CPUC do not object in writing within 10 days to CAISO's written notification, the notification provided pursuant to this paragraph will suspend the final compliance date for the shorter of 90 days or the time CAISO determines necessary to maintain reliability. In the event either CEC or CPUC objects as provided in this paragraph, then the State Water Board shall hold a hearing as expeditiously as possible to determine whether to suspend the compliance date in accordance with paragraph (d).

(b) **Suspension of Final Compliance Date for Longer Than 90 Days, or consecutive less than 90 day suspensions, for *Existing Power Plants** Within CAISO Jurisdiction.** If CAISO determines that continued operation of an *existing power plant** is necessary to maintain the reliability of the electric system, CAISO shall provide written notification to the State Water Board, the Regional Water Board with jurisdiction over the *existing power plant**, and the SACCWIS. If the Executive Directors of the CEC and CPUC do not object in writing within 10 days to CAISO's

determination, the notification provided pursuant to this paragraph will suspend the final compliance date for 90 days. During the 90-day time suspension or within 90 days of receiving a written notification from CAISO, the State Water Board shall conduct a hearing in accordance with paragraph (d) to determine whether to suspend the final compliance date for more than the original 90 days pending, if necessary, full evaluation of amendments to final compliance dates contained in the policy.

(c) **Suspension of Final Compliance Date for *Existing Power Plants** Within Los Angeles Department of Water and Power (LADWP) Service Area.** If the LADWP Commission determines, through a public process, that continued operation of an *existing power plant** operated by LADWP is necessary to maintain the reliability of the electric system in the short-term, LADWP shall provide written notification to the State Water Board, the Regional Water Board with jurisdiction over the *existing power plant**, and the SACCWIS. Within 45 days of receiving a written notice from LADWP, the State Water Board shall conduct a hearing in accordance with paragraph (d) to determine whether to suspend the final compliance date. In considering whether to suspend or amend the final compliance dates the State Board shall consult with the CAISO.

(d) **State Water Board Hearings on Suspension of Final Compliance Dates.** In considering whether to suspend or amend the final compliance dates, the State Water Board shall afford significant weight to the recommendations of the CAISO.

C. Immediate and Interim Requirements

(1) No later than October 1, 2011, the owner or operator of an *existing power plant** with an *offshore intake** shall install large organism exclusion devices having a distance between exclusion bars of no greater than nine inches, or install other exclusion devices, deemed equivalent by the State Water Board.

(2) No later than October 1, 2011, the owner or operator of an *existing power plant** unit that is not directly engaging in *power-generating activities**, or *critical system maintenance**, shall cease intake flows, unless the owner or operator demonstrates to the State Water Board that a reduced minimum flow is necessary for operations.

(3) The owner or operator of an *existing power plant** must implement measures to mitigate the interim impingement and entrainment impacts resulting from the cooling water intake structure(s), commencing October 1, 2015 and continuing up to and until the owner or operator achieves final compliance. The owner or operator must include in the

implementation plan, described in Section 3.A below, the specific measures that will be undertaken to comply with this requirement. An owner or operator may comply with this requirement by:

(a) Demonstrating to the State Water Board's satisfaction that the owner or operator is compensating for the interim impingement and entrainment impacts through existing mitigation efforts, including any projects that are required by state or federal permits as of October 1, 2010; or

(b) Demonstrating to the State Water Board's satisfaction that the interim impacts are compensated for by the owner or operator providing funding to the California Coastal Conservancy which will work with the California Ocean Protection Council to fund an appropriate *mitigation project**; or

(c) Developing and implementing a *mitigation project** for the facility, approved by the State Water Board, which will compensate for the interim impingement and entrainment impacts. Such a project must be overseen by an advisory panel of experts convened by the State Water Board.

(d) The *habitat production foregone** method, or a comparable alternate method approved by the State Water Board, shall be used to determine the habitat and area, based on replacement of the annual entrainment, for funding a *mitigation project**.

(e) It is the preference of the State Water Board that funding is provided to the California Coastal Conservancy, working with the California Ocean Protection Council, for mitigation projects directed toward increases in marine life associated with the State's Marine Protected Areas in the geographic region of the facility.

(4) Owners or operators of fossil fueled units that have submitted implementation plans to comply with this Policy under Section 2.A(1) and have requested compliance dates after December 31, 2022 that are approved by the State Water Board as provided in Section 3.E shall:

(a) Commit to eliminate OTC and seawater use for cooling water purposes for all units at the facility.

(b) Conduct a study or studies, singularly or jointly with other facilities, to evaluate new technologies or improve existing technologies to reduce impingement and entrainment.

(c) Submit the results of the study and a proposal to minimize entrainment and impingement to the Chief Deputy Director no later than December 31, 2015.

(d) Upon approval of the proposal by the Chief Deputy Director, complete implementation of the proposal no later than December 31, 2020.

D. *Nuclear-Fueled Power Plants**

If the owner or operator of an existing *nuclear-fueled power plant** demonstrates that compliance with the requirements for *existing power plants** in Section 2.A, above, of this Policy would result in a conflict with any safety requirement established by the Commission, with appropriate documentation or other substantiation from the Commission, the State Water Board will make a site- specific determination of best technology available for minimizing adverse environmental impact that would not result in a conflict with the Commission's safety requirements. The State Water Board may also establish alternative, site- specific requirements in accordance with Section 3.D (8).

3. Implementation Provisions

A. With the exception of *nuclear-fueled power plants**, which are covered under 3.D, below, no later than April 1, 2011, the owner or operator of an *existing power plant** shall submit an implementation plan to the State Water Board.

(1) The implementation plan shall identify the compliance alternative selected by the owner or operator, describe the general design, construction, or operational measures that will be undertaken to implement the alternative, and propose a realistic schedule for implementing these measures that is as short as possible. If the owner or operator chooses to repower the facility to reduce or eliminate reliance upon OTC, or to retrofit the facility to implement either Track 1 or Track 2 alternatives, the implementation plan shall identify the time period when generating power is infeasible and describe measures taken to coordinate this activity through the appropriate electrical system balancing authority's maintenance scheduling process.

(2) If the owner or operator selects *closed-cycle wet cooling** as a compliance alternative, the owner or operator shall address in the implementation plan whether recycled water of suitable quality is available for use as makeup water.

B. The SACCWIS shall be impaneled no later than January 1, 2011, by the Executive Director of the State Water Board, to advise the State Water Board on the implementation of this Policy to ensure that the implementation schedule takes into account local area and grid reliability, including permitting

constraints. SACCWIS shall include representatives from the CEC, CPUC, CAISO, CCC, SLC, ARB, and State Water Board.

(1) SACCWIS meetings shall be scheduled regularly and as needed. Meetings shall be open to the public and shall be noticed at least 10 days in advance of the meeting. All SACCWIS products shall be made available to the public.

(2) The SACCWIS shall review the owner or operator's proposed implementation schedule and report to the State Water Board with recommendations no later than October 1, 2011. The SACCWIS may consult with other appropriate agencies, including but not limited to the Regional Water Boards, air quality districts, and the LADWP, in the process of reviewing implementation schedules and providing recommendations to the State Water Board.

(3) The CAISO and the LADWP shall each submit to the SACCWIS by December 31 and January 31, respectively, each year a grid reliability study for their respective jurisdictions that has been developed pursuant to a public process and approved by their governing bodies. In order to assure that SACCWIS can provide annual reports to the State Water Board by March 31, the SACCWIS shall promptly meet to consider the reliability studies submitted by CAISO and the LADWP.

(4) The SACCWIS will report to the State Water Board with recommendations on modifications to the implementation schedule every year starting in 2012. If members of SACCWIS do not believe the full committee recommendations reflect their concerns they may issue minority recommendations that the State Water Board shall consider as part of the SACCWIS recommendations.

(5) The State Water Board shall consider the SACCWIS' recommendations and, if appropriate, consider modifications to this Policy. In the event that the SACCWIS energy agencies (CAISO, CPUC, and CEC) make a unanimous recommendation for implementation schedule modification based on grid reliability, the State Water Board shall afford significant weight to the recommendation.

C. The Regional Water Board shall reissue or, as appropriate, modify NPDES permits issued to owners or operators of *existing power plants*,* after a hearing in the affected region, to ensure that the permits conform to the provisions of this Policy.

(1) The permits shall incorporate a final compliance schedule that requires compliance no later than the due dates contained in Table 1, contained in Section 3.E, below. If the State Water Board determines that a longer compliance schedule is necessary to maintain reliability of the electric system per SACCWIS recommendations while other OTC power plants

are retrofitted, repowered, or retired or transmission upgrades take place, this delay shall be incorporated into the compliance schedule and stated in the permit findings.

(2) The Regional Water Board shall reopen, if necessary, the relevant permits and modify the final compliance schedules, if appropriate, based on modifications to the policy approved by the State Water Board or the suspension of final compliance dates pursuant to this policy.

(3) If an owner or operator selects Track 2 as the compliance alternative, the NPDES permit shall include a monitoring program that complies with Section 4 of this Policy.

(4) NPDES permits issued by the Regional Water Board shall include appropriate permit provisions to implement suspensions of final compliance dates authorized in Section 2.B (2) and modifications to final compliance dates specified in this policy, without reopening the permits.

D. No later than January 1, 2011 the Executive Director of the State Water Board, using the authority under section 13267(f) of the Water Code, shall request that Southern California Edison (SCE) and Pacific Gas & Electric Company (PG&E) conduct special studies for submission to the State Water Board.

(1) The special studies shall investigate alternatives for the *nuclear-fueled power plants** to meet the requirements of this Policy, including the costs for these alternatives.

(2) The special studies shall be conducted by an independent third party with engineering experience with nuclear power plants, selected by the Executive Director of the State Water Board.

(3) The special studies shall be overseen by a Review Committee, established by the Executive Director of the State Water Board no later than January 1, 2011, which shall include, at a minimum, representatives of SCE, PG&E, SACCWIS, the environmental community, and staffs of the State Water Board, Central Coast Regional Water Board, and the San Diego Regional Water Board.

(4) No later than October 1, 2011, the Review Committee, described above, shall provide a report for public comment detailing the scope of the special studies, including the degree to which existing, completed studies can be relied upon.

(5) No later than October 1, 2013 the Review Committee shall provide the final report and the Review Committee's comments for public comment detailing the results of the special studies and shall present the report to the State Water Board.

(6) Meetings of the Review Committee shall be open to the public and shall be noticed at least 10 days in advance of the meeting. All products of the Review Committee shall be made available to the public.

(7) The State Water Board shall consider the results of the special studies, and shall evaluate the need to modify this Policy with respect to the *nuclear-fueled power plants**. In evaluating the need to modify this Policy, the State Water Board shall base its decision to modify this Policy with respect to the *nuclear- fueled power plants** on the following factors:

(a) Costs of compliance in terms of total dollars and dollars per megawatt hour of electrical energy produced over an amortization period of 20 years;

(b) Ability to achieve compliance with Track 1 considering factors including, but not limited to, engineering constraints, space constraints, permitting constraints, and public safety considerations;

(c) Potential environmental impacts of compliance with Track 1, including, but not limited to, air emissions.

(8) If the State Water Board finds that for a specific *nuclear-fueled power plant** to implement Track 1, either

(a) the costs are wholly out of proportion to the costs identified in Tetra Tech, Inc., California's Coastal Power Plants: Alternative Cooling System Analysis, February 2008 (see pages ES-10 [summary], C-1 - C-2 and C- 23 - C-40 [Diablo Canyon Power Plant] and N-1 - N-2 and N-25 - N-42 [San Onofre Nuclear Generating Station]) and considered by the State Water Board in establishing Track 1, or

(b) compliance is wholly unreasonable based on the factors in paragraphs 7(b) and (c), then the State Water Board shall establish alternate requirements for that *nuclear-fueled power plant**. The State Water Board shall establish alternative requirements no less stringent than justified by the wholly out of proportion (i) cost and (ii) factor(s) of paragraph (7). The burden is on the person requesting the alternative requirement to demonstrate that alternative requirements should be authorized.

(9) In the event the State Water Board establishes alternate requirements for *nuclear-fueled power plants**, the difference in impacts to marine life resulting from any alternative, less stringent requirements shall be fully mitigated. Mitigation required pursuant to this paragraph shall be a *mitigation project** directed toward the increase in marine life associated with the State's Marine Protected Areas in the geographic region of the facility. Funding for the *mitigation project** shall be provided to the California Coastal Conservancy, working with the Ocean Protection Council to fund an appropriate *mitigation project**.

E. Table 1. Implementation Schedule

	Milestone	Responsible Entity/Party	Due Date[2]
1	Request SCE and PG&E to conduct special studies to investigate compliance options for nuclear-fueled power plants* [Section 3.D]	State Water Board Executive Direction	01/01/2011
2	Establish Review Committee [Section 3.D(3)]	State Water Board Executive Director	01/01/2011
3	Establish SACCWIS [Section 3.B]	State Water Board Executive Director	01/01/2011
4	Submit a proposed implementation plan to the State and Regional Water Boards [Section 3.A]	Owner/operators of existing fossil- fueled power plants	04/01/2011
5	Provide a report for public comment, detailing the scope of the special studies on compliance options for nuclear-fueled power plants* [Section 3.D(4)]	Review Committee	10/01/2011
6	Review the owners or operators' proposed implementation schedules and report to the State Water Board with recommendations [Section 3.B(2)]	SACCWIS	10/01/2011
7	Humboldt Bay Power Plant in compliance	Owner/operator	12/31/2010
8	Potrero Power Plant in compliance	Owner/operator	10/01/2011
9	Install large organism exclusion devices with a distance between exclusion bars of no greater than nine inches, or equivalent device [Section 2.C(1)]	Owner/operators of existing power plants* with offshore intakes*	10/01/2011

[2] These compliance dates were developed considering information provided by the CEC, CPUC, CAISO, and LADPW

	Milestone	Responsible Entity/Party	Due Date[2]
10	Cease intake flows for units not directly engaging in power-generating activities* or critical system maintenance*, or demonstrate to the State Water Board that a reduced minimum flow is necessary for operations [Section 2.C(2)]	Owner/operators of existing power plants*	10/01/2011
11	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2012
12	South Bay Power Plant in compliance	Owner/operator	12/31/2011
13	Report to State Water Board on results of special studies on compliance options for nuclear-fueled power plants* [Section 3.D(5)]	Review Committee	10/01/2013
14	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2013
15	Haynes units 5 & 6 in compliance, repowered without OTC	LADWP	12/31/2013
16	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2014
17	Commence to implement measures to mitigate the interim impingement and entrainment impacts due to the cooling water intake structure(s) [Section 2.C(3)]	Owners/operators of existing power plants*	10/01/2015
18	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2015
19	El Segundo and Morro Bay power plants in compliance	Owner/operator	12/31/2015
20	Scattergood unit 3 in compliance, repowered without OTC	LADWP	12/31/2015

	Milestone	Responsible Entity/Party	Due Date[2]
21	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2016
22	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2017
23	Power plants in CPUC 2010 LTPP Cycle in compliance: Encina Unit 1, Contra Costa, Pittsburg [Section 1.J]	Owner/Operator	12/31/2017
24	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2018
25	Encina Power Station Units 2-5 in compliance [Section 1.J]	Owner/Operator	12/31/2018
26	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2019
27	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2020
28	Huntington Beach Units 1, 3, and 4; Redondo Beach Unit 7; Alamitos Units 1, 2, and 6; Mandalay; and Moss Landing in compliance	Owner/operator	12/31/2020
29	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2021
30	Redondo Beach Units 5, 6, and 8 in compliance	Owner/operator	12/31/2021
31	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2022
32	San Onofre Nuclear Generating Station in compliance with implementation provisions resulting from State Water Board action on special studies from Section 3.D	Owner/operator	12/31/2022

	Milestone	Responsible Entity/Party	Due Date[2]
33	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2023
34	Alamitos Units 3, 4, and 5; Huntington Beach Unit 2; and Ormond Beach in compliance	Owner/operator	12/31/2023
35	Report to State Water Board on status of implementation of Policy [Section 3.B(3)]	SACCWIS	03/31/2024
36	Diablo Canyon Nuclear Power Plant Unit 1 in compliance	Owner/operator	11/02/2024
37	Scattergood units 1 & 2 in compliance, repowered without OTC	LADWP	12/31/2024
38	Diablo Canyon Nuclear Power Plant Unit 2 in compliance	Owner/operator	08/26/2025
39	Haynes units 1 & 2 in compliance, repowered without OTC	LADWP	12/31/2029
40	Harbor unit 5 in compliance, repowered without OTC	LADWP	12/31/2029
41	Haynes unit 8 in compliance, repowered without OTC	LADWP	12/31/2029

4. Track 2 Monitoring Provisions

A. Impingement Impacts: The following impingement studies are required to comply with Section 2.A.(2)(a)(ii):

(1) A baseline impingement study shall be performed, unless the discharger demonstrates, to the Regional Water Board's satisfaction, that prior studies accurately reflect current impacts. Baseline impingement shall be measured on-site and shall include sampling for all species impinged. The impingement study shall be designed to accurately characterize the species currently impinged and their seasonal abundance to the satisfaction of the Regional Water Board.

(a) The study period shall be at least 36 consecutive months.

(b) Impingement shall be measured during different seasons when the cooling system is in operation and over 24-hour sampling periods.

(c) When applicable, impingement shall be sampled under differing representative operational conditions (e.g., differing levels of power production, heat treatments, etc.).

(d) The study shall not result in any additional mortality above typical operating conditions.

(2) After the Track 2 controls are implemented, to confirm the level of impingement controls, another impingement study, consistent with Section 4.A(1)(a) to (d), above, shall be performed and reported to the Regional Water Board.

(3) The need for additional impingement studies shall be evaluated at the end of each permit period. Impingement studies shall be required when changing operational or environmental conditions indicate that new studies are needed, at the discretion of the Regional Water Board.

B. Entrainment Impacts: The following entrainment studies are required to comply with Section 2.A.(2)(b)(ii):

(1) A baseline entrainment study shall be performed, unless the discharger demonstrates, to the Regional Water Board's satisfaction, that prior studies accurately reflect current impacts. Prior studies that may have used a mesh size of 333 or 335 microns for sampling are acceptable for compliance with the review and approval of the Regional Water Board. If the Regional Water Board determines that a new baseline entrainment study shall be performed to determine larval composition and abundance in the source water, representative of water that is being entrained, then samples must be collected using a mesh size no

larger than 335 microns. Additional samples shall also be collected using a 200 micron mesh to provide a broader characterization of other *meroplankton** entrained. The source water shall be determined based on oceanographic conditions reasonably expected after Track 2 controls are implemented. Baseline entrainment sampling shall provide an unbiased estimate of larvae entrained at the intake prior to the implementation of Track 2 controls.

(a) Entrainment impacts shall be based on sampling for all *ichthyoplankton** and invertebrate *meroplankton** species. Individuals collected shall be identified to the lowest taxonomical level practicable. When practicable, genetic identification through molecular biological techniques may be used to assist in compliance with this requirement. Samples shall be preserved and archived such that genetic identification is possible at a later date.

(b) The study period shall be at least 36 consecutive months, and shall occur during different seasons, including periods of peak use when the cooling system is in operation (such as the summer months when energy is in high demand). Sampling shall be designed to account for variation in oceanographic conditions and larval abundance and behavior such that abundance estimates are reasonably accurate.

(2) After the Track 2 controls are implemented, to confirm the level of entrainment controls, another entrainment study (with a study design to the Regional Water Board's satisfaction, with samples collected using a mesh size no larger than 335 microns, and with additional samples also collected using a 200 micron mesh) shall be performed and reported to the Regional Water Board.

(3) The need for additional entrainment studies shall be evaluated at the end of each permit period. Entrainment studies shall be required when changing operational or environmental conditions indicate that new studies are needed, at the discretion of the Regional Water Board.

5. Definition of Terms

Closed-cycle wet cooling system – Refers to a cooling system, which functions by transferring waste heat to the surrounding air through the evaporation of water, thus enabling the reuse of a smaller amount of water several times to achieve the desired cooling effect. The only discharge of wastewater is from periodic blowdown for the purpose of limiting the buildup of concentrations of materials in excess of desirable limits established by best engineering practice.

Combined-cycle power-generating units - Refers to units within a power plant which combined generate electricity through a two-stage process involving combustion and steam. Hot exhaust gas from combustion turbines is passed through a heat recovery steam generator to produce steam for a steam turbine. The turbine exhaust steam is condensed in the cooling system and may or may not be returned to the power cycle. Combined cycle power- generating units are generally more fuel-efficient and use less cooling water than steam boiler units with the same generating capacity.

Critical system maintenance – are activities that are critical for maintenance of a plant's physical machinery and absolutely cannot be postponed until the unit is operating to generate electricity.

Existing power plant(s) – Refers to any power plant that is not a *new power plant**.

Habitat production foregone – Refers to the product of the average annual *proportional mortality** and the estimated area of the water body that is habitat for the species' source population. Habitat production foregone is an estimate of habitat area production that is lost to all entrained species on an annual basis.

Ichthyoplankton – Refers to the planktonic early life stages of fish (i.e., the pelagic eggs and larval forms of fishes).

Intake flow rate – Refers to the instantaneous rate at which water is withdrawn through the intake structure, expressed as gallons per minute.

Meroplankton – For purposes of this Policy, refers to that component of the *zooplankton** community composed of squid paralarvae and the pelagic larvae of benthic invertebrates.

Mitigation project – Projects to restore marine life lost through impingement mortality and entrainment. Restoration of marine life may include projects to restore and/or enhance coastal marine or estuarine habitat, and may also include protection of marine life in existing marine habitat, for example through the funding of implementation and/or management of Marine Protected Areas.

New power plant – Refers to any plant that is a "new facility", as defined in

40 C.F.R. § 125.83 (revised as of July 1, 2007), and that is subject to Subpart I, Part 125 of the Code of Federal Regulations (revised as of July 1, 2007) (referred to as "Phase I regulations").

Not Feasible – Cannot be accomplished because of space constraints or the inability to obtain necessary permits due to public safety considerations, unacceptable environmental impacts, local ordinances, regulations, etc. Cost is not a factor to be considered when determining feasibility under Track 1.

Nuclear-fueled power plant(s) – Refers to Diablo Canyon Power Plant and/or San Onofre Nuclear Generating Station.

Offshore intake –refers to any submerged intake structure that is not located at the shoreline, and includes such intakes that are located in ocean, bay and estuary environments.

Power-generating activities – Refers to activities directly related the generation of electrical power, including start-up and shut-down procedures, contractual obligations (hot stand-by), hot bypasses, and *critical system maintenance** regulated by the Nuclear Regulatory Commission. Activities that are not considered directly related to the generation of electricity include (but are not limited to) dilution for in-plant wastes, maintenance of source-and receiving water quality strictly for monitoring purposes, and running pumps strictly to prevent fouling of condensers and other power plant equipment.

Proportional mortality – the proportion of larvae killed from entrainment to the larvae in the source population, as determined by an Empirical Transport Model.

Zooplankton – For purposes of this Policy, refers to those planktonic invertebrates larger than 200 microns.